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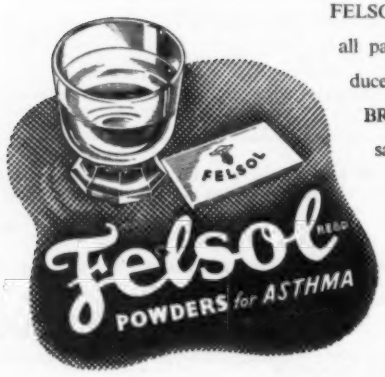

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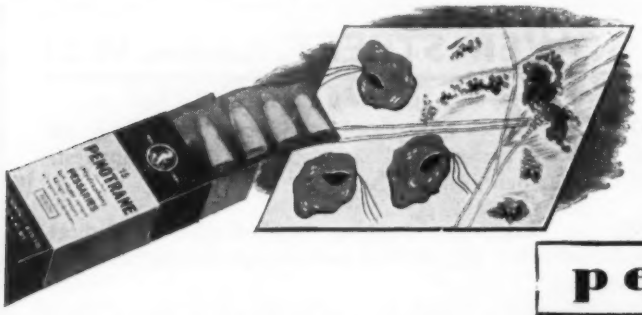

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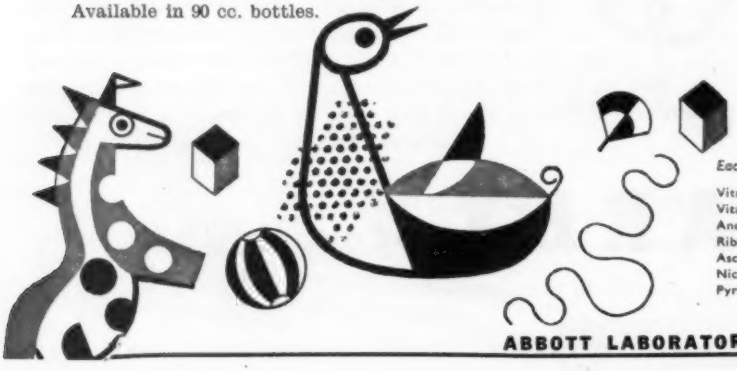

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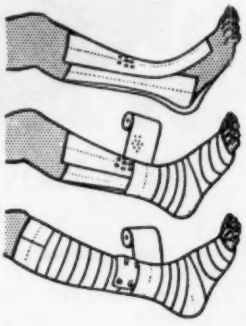

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4445	*MEDIUM CHROMIC Non-boilable*	*5 ft.*	*0000-3*	*3 doz. envs. per jar*

★ ***WRITE FOR FULLY DESCRIPTIVE BOOKLET***

Sole Distributors in United Kingdom:

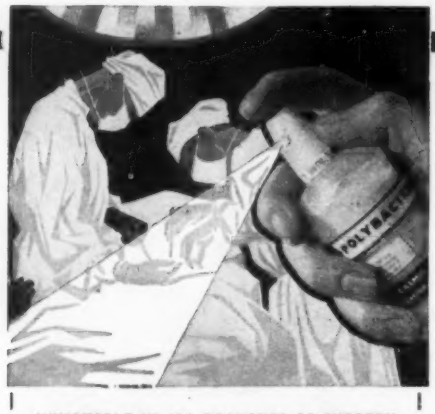
Chas. F. Thackray LTD LEEDS & LONDON

Head Office: **THE OLD MEDICAL SCHOOL, PARK STREET, LEEDS 1**
Tel. 20085 (5 lines). Cables: "Aseptic, Leeds 1."
London Office: 38 Welbeck Street, London W.1. Tel. WELbeck 8152/3.
Also at Johannesburg and Cape Town.

MADE IN UNITED KINGDOM BY CYANAMID OF GREAT BRITAIN LTD.

POLYBACTRIN

antibiotic powder spray



INVALUABLE IN ALL BRANCHES OF SURGERY

Polybactrin provides a unique and economical means of applying a combination of Zinc Bacitracin, Neomycin Sulphate and Polymixin 'B' Sulphate—the three antibiotics of choice for topical use. The antibiotics are presented in an ultra-fine powder form dispersed under pressure with a propellant, and unlike other means of powder insufflation in common use, there is no risk of contamination of the antibiotics by airborne pathogens obtaining entry into the unit by suction.

A FRACTIONAL RELEASE GIVES COMPLETE DISPERSAL OF POWDER OVER THE WOUND

1. The *Polybactrin* unit offers a new technique for topical application of antibiotic therapy, enabling an efficient, economical and dry coverage of the wound area to be made.
2. The extensive range of bactericidal activity afforded by the triad of bacitracin, neomycin and polymixin gives an extremely wide coverage of wound pathogens without the risk of inducing resistant strains of organisms.
3. Ps. pyocyaneus, particularly present in burns, is completely inhibited by polymixin, considerably reducing the healing time.
4. *Polybactrin* is not readily absorbed and there is no risk of systemic toxicity occurring.
5. The propellant gas is non-toxic and does not support combustion.
6. There are no contra-indications to the use of *Polybactrin*. Systemic therapy may be given concurrently if necessary.

FORMULA: Each pack contains: Neomycin Sulphate 750 mg. Polymixin 'B' Sulphate 150,000 units. Zinc Bacitracin 37,500 units. Propellent 83.5 g. Net contents 85 g.

POLYBACTRIN antibiotic powder spray

No samples available

CREWE: *Telephone: Crewe 3251-5*

CALMIC LIMITED

LONDON: *2 Mansfield Street, W.1 Tel: LANgham 8038-9*

AUSTRALIA: 458-468 Wattle Street, Ultimo. Sydney, N.S.W. **CANADA:** Terminal Building, York Street, Toronto

P1

that is why

Maw's Nadecon is the preferred prescription. It permits the employment of Menthol in significant concentration and in an aqueous form.

Maw's Nadecon is indicated for the local treatment of catarrhal conditions of the upper respiratory tract. It gives immediate relief and comfort to the patient through increased ventilation with improved drainage from the infected paranasal sinuses. It establishes a pH unfavourable to bacterial development, together with conditions complementary to natural processes of recovery. When instilled into the nostrils the transient awareness of Nadecon serves to restrict excessive dosage. It is suitable for both Adult and Child patients.

Freely prescribable on EC.10 (Category 3/4)

presents **MENTHOL** *in an aqueous vehicle*

Maw's

Nadecon

Nasal Decongestant

FORMULA	*%W/V*
Menthol	*0.25*
Pseudoephedrine HCl	*0.99*
Chlorbutol	*0.25*
Aqueous Vehicle	*to 100*

S. Maw Son and Sons Limited · Barnet · England

G449

The first Water-soluble chloramphenicol

By preparing the water-soluble sodium salt of chloramphenicol succinic ester CARLO ERBA have finally solved the therapeutic problem of parenteral (*intramuscular, intravenous, intraspinal*) and topical (*aerosol, intrabronchial, intrapleural*, etc.) administration of this antibiotic.

KEMICETINE Succinate

CARLO ERBA MILANO

Natural sleep without narcosis

Why is it that more and more doctors are prescribing MILTOWN meprobamate as a dormifacient? For several reasons—MILTOWN relieves the anxieties and tensions that prevent the natural onset of sleep—after MILTOWN, the patient lies quietly without worrying until he drifts into sleep. It thus relaxes the patient for natural sleep rather than forcing it. Furthermore, after MILTOWN, sleep is restful and usually dreamless and is not followed by hang-over effects on awakening. Where MILTOWN is used as a daytime sedative, the patient does not usually require an additional hypnotic for sleep at night.

Miltown*

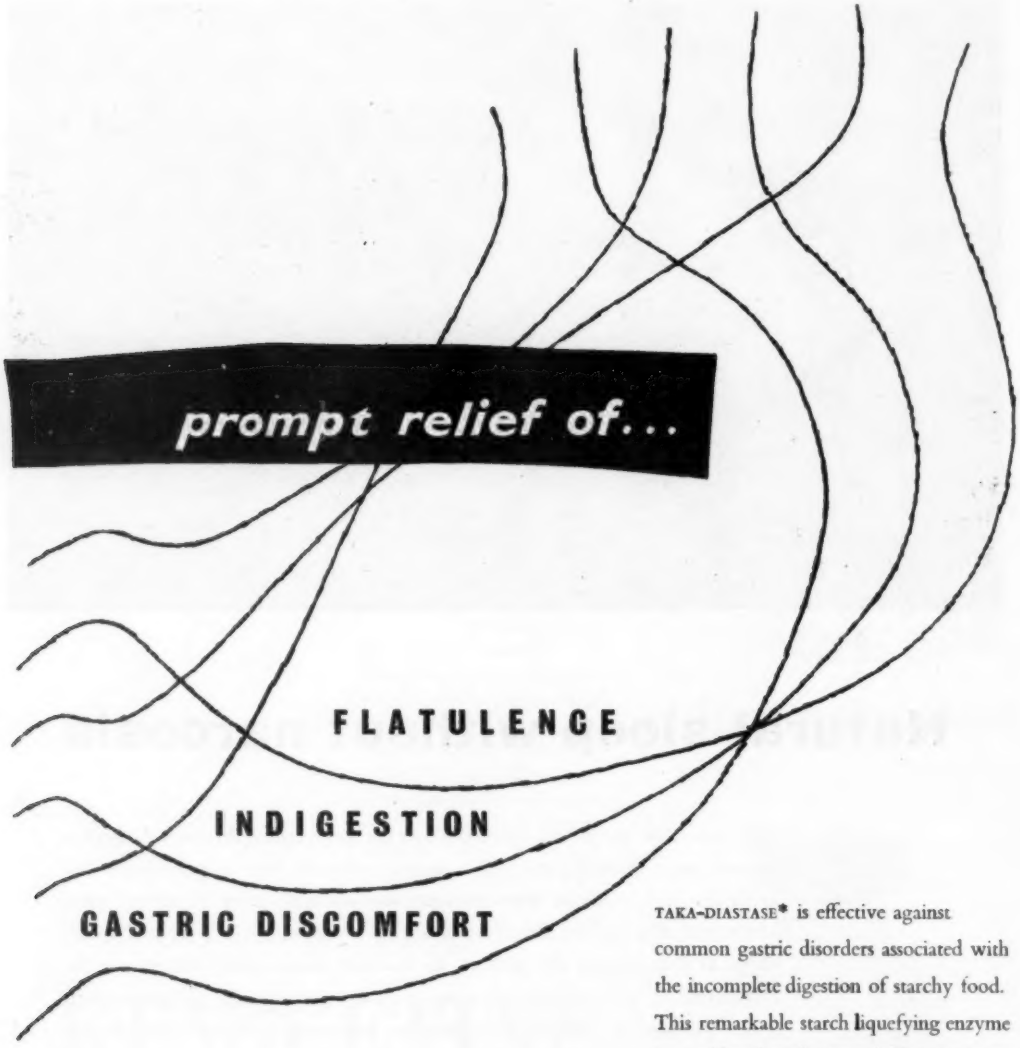
* Trademark of Carter Products Inc. MEPROBAMATE

Relaxes mind and body . . . gives natural sleep without narcosis

Oral tablets of 400 mg.
Bottles of 50 and 500.

Hypnotic Dosage:
2 tablets, 1 hour before retiring.

Lederle LEDERLE LABORATORIES DIVISION
Cyanamid OF GREAT BRITAIN LTD., London, W.C.2



TAKA-DIASTASE* is effective against common gastric disorders associated with the incomplete digestion of starchy food. This remarkable starch liquefying enzyme is capable of rendering soluble 300 times its own weight of cooked starch in ten minutes, under conditions approximating to those of the normal stomach.

TAKA-DIASTASE

starch-liquefying enzyme

* *Trade Mark*

Taka-Diastase Sedative Elixir (No. 198)
A combination of Taka-Diastase, bismuth and nux vomica for dyspepsia accompanied by nausea or pain. Bottles of 4, 16 and 80 fl. ozs.

Takazyme
Taka-Diastase, with insoluble carbonates. Gives 3-fold relief of (1) hyperacidity, (2) undigested starch, (3) irritation of gastric mucosa. Powder in jars of 2 ozs. and tins of 1 lb. Lozenges in bottles of 30 and 100.

PARKE, DAVIS & COMPANY, LTD (*Inc. U.S.A.*) HOUNSLOW, MIDDLESEX. *Telephone: Hounslow 2361*
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The
ELECTRIC BLANKET in the TUBE

FINALGON Regd. Trade Mark
OINTMENT

Produces a glowing feeling of warmth
which lasts for hours
and relieves rheumatic pain

Tube of 20 g.

COMPOSITION
Nonylic acid vanillylamide 0.4% and
Nicotinic acid-β-butoxyethyl ester
2.5% in a suitable ointment base.
5073/E

LEWIS LABORATORIES LTD., LEEDS 9
*Q 15

Transvasin

brings the esters of NICOTINIC ACID SALICYLIC ACID p-AMINOBENZOIC ACID

to the focal point of soft-tissue rheumatism

The esters in Transvasin, a new preparation developed by Hamol S.A., our Swiss associates, readily pass the skin barrier in therapeutic quantities and enable an effective concentration of the drugs to be built up where they are needed.* Transvasin not only induces vasodilation of the skin with a superficial erythema, but also brings about a deep hyperaemia of the underlying tissues. It is non-irritant, and can be safely used on delicate skins. It is now being widely prescribed with successful clinical results. Since a very small quantity is sufficient for each application, the cost of treatment is extremely low.

Salicylic acid tetrahydrofurfuryl-ester	14%
Nicotinic acid ethyl-ester	2%
Nicotinic acid n-hexyl-ester	2%
p-Aminobenzoic acid ethyl-ester	2%
Water-miscible cream base ad	100%

**Therapeutische Umschau VIII*, 1952, 10, 143

Transvasin is available in 1 oz. tubes, basic N.H.S. price in the U.K. 2/6 plus P.T., and is not advertised to the public. It may be prescribed on Form E.C.10. Samples and literature will gladly be sent on application.

LLOYD-HAMOL LTD., 11 WATERLOO PLACE, LONDON, S.W.1. WHITEHALL 8654/5/6

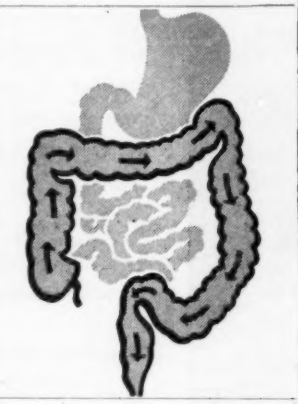
Transvasin is the registered trade mark of Lloyd-Hamol Ltd.

BOWEL RE-TRAINING WITH SENOKOT

1. The ingested senna glycosides are absorbed into the blood stream from the upper gastro-intestinal tract. There is no disturbance of gastric or small intestine motility.

2. From the blood stream a proportion of the glycosides are excreted into the large bowel. During their circulation in the blood stream senna glycosides are inert.

3. In the large bowel, enzymatic action of the normal flora converts the glycosides into the active principles which stimulate peristalsis, without mucosal irritation.



4. This stimulant action is a neuro-muscular one mediated through Auerbach's plexus thus "... providing a good imitation of normal defaecation." (*Lancet*, *1952*, **1**, *655*).

Senokot is not a laxative in the usual sense. It is efficient in obstinate constipation and has a re-educative and curative value in the chronic case. In a high proportion of patients normal bowel sensitivity and reflex evacuation are restored and treatment discontinued.

℞ Senokot

STANDARDIZED SENNA

Granules: 1-2 teaspoonfuls. Tablets: 2-4

GRANULES: 2 oz., 6 oz. and 2 lb.

TABLETS: 50, 200 and 1,000

Cost about a halfpenny a dose.

SENOKOT is not advertised to the public, has no B.P. or N.F. equivalent, and is freely prescribable under the N.H.S.

WESTMINSTER LABORATORIES LTD., CHALCOT RD., LONDON, N.W.1

G505

Clinically proven

SPARINE

(PROMAZINE HYDROCHLORIDE)

the *new* phenothiazine derivative

Sparine has already brought decisive and dramatically effective relief to many hundreds of patients. It calms the troubled seas of the mind. Most of the published clinical reports are concerned primarily with its use in the management of psychiatric conditions. But evidence is accumulating rapidly in support of the many other indications for this drug in everyday medical practice.

Sparine not only controls psychomotor overactivity: it is also synergistic with analgesics, hypnotics and anaesthetics, and is a potent anti-emetic. Little wonder, therefore, that the predictions of the pharmacologists have been amply justified by the successes of Sparine treatment in such diverse conditions as terminal carcinoma and nausea of pregnancy. Full details of indications and dosage will be supplied on request.

PACKS:

For parenteral administration—

5% solution (50 mg. per ml.) in 2 ml. ampoules. Boxes of 10.

For oral administration—

Coated tablets of 25 mg. (yellow).
50 mg. (orange).
100 mg. (red).
Bottles of 50 and 250.

Wyeth

The word 'Sparine' is a trade mark

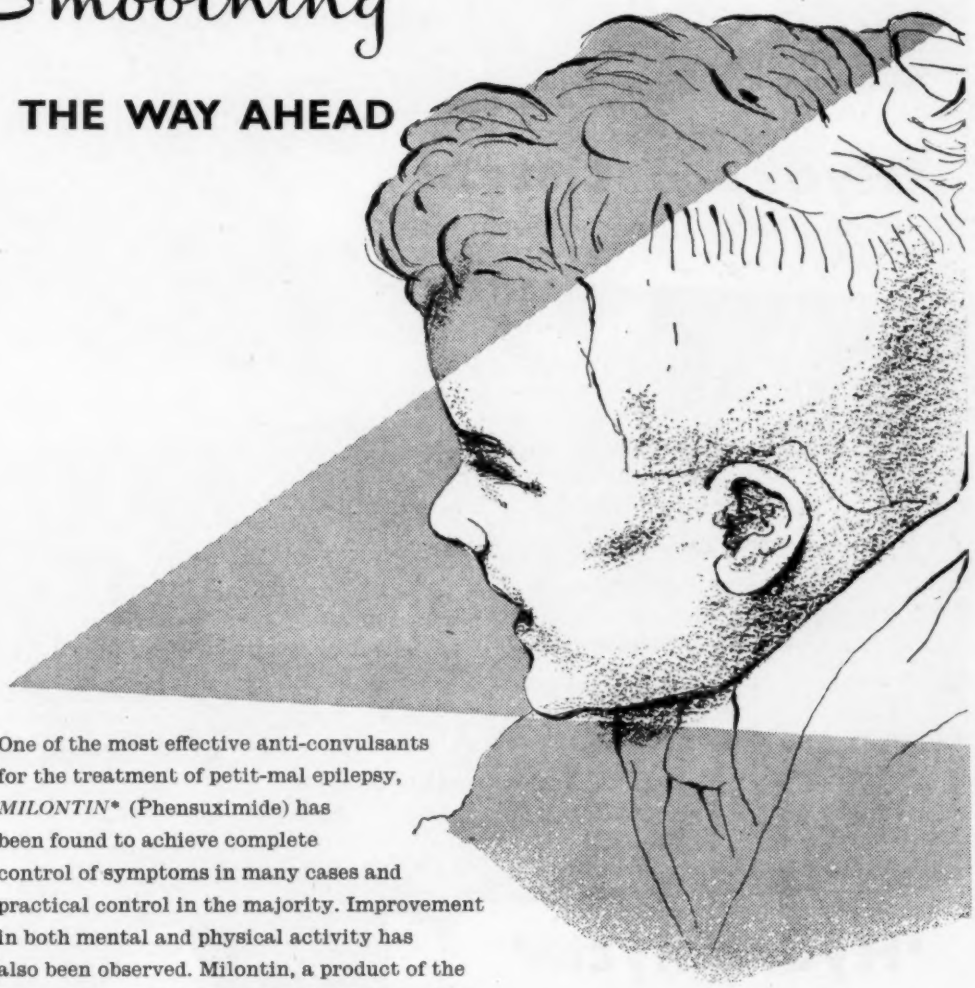
JOHN WYETH & BROTHER LIMITED

Clifton House, Euston Road, London, N.W.1.

Sp.1

Smoothing

THE WAY AHEAD



One of the most effective anti-convulsants for the treatment of petit-mal epilepsy, *MILONTIN** (Phensuximide) has been found to achieve complete control of symptoms in many cases and practical control in the majority. Improvement in both mental and physical activity has also been observed. Milontin, a product of the Parke-Davis Research Laboratories, is rapidly absorbed, well-tolerated and relatively non-toxic

Milontin Capsules, 0.5 G. and 0.25 G. in bottles of 50 and tins of 500.

Milontin for **PETIT-MAL** Epilepsy

* *Trade Mark*

PARKE, DAVIS & CO. LTD. *(Inc. U.S.A.)* HOUNSLOW, MIDDLESEX. Telephone Hounslow 2361
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Boots

'Hydrocortistab'

TOPICAL HYDROCORTISONE PREPARATIONS

A comprehensive range to meet every requirement in dermatological and ophthalmological practice

Skin ointment
Eye ointment
Eye drops
Cream
Lotion

'Hydromycin'

HYDROCORTISONE AND NEOMYCIN

Skin ointment
Ear/Eye ointment
Ear/Eye drops

Boots

Full details of strengths and sizes gladly sent on request

BOOTS PURE DRUG COMPANY LTD. NOTTINGHAM ENGLAND

8272

Wind in the grass . . .

. . . and pollen in the air bring discomfort to thousands at this time of year. For Hay Fever sufferers Pabracort Insufflations have proved their value by clinical trial and in general practice. Dramatic relief is usually obtained within two or three days and complete alleviation after two weeks' treatment.

Each insufflation capsule contains 15 mg. hydrocortisone acetate in a specially prepared snuff base (micronized).

Reference: Lancet (1956) i., 537.

PABRACORT

INSUFFLATIONS

Packings: Pabracort outfit (10 capsules and insufflator) Capsules 10, 25, 100.

PAINES AND BYRNE LTD., PABYRN LABORATORIES, GREENFORD, MIDDX

When a heavy day makes

this...

begin to feel like

this...

the drill for you is

GLUCODIN

TRADE MARK

98% pure glucose

In 1 lb containers

In some overseas countries Glucodin is sold under the following alternative names: Glucolin, Glaxose-D and Glucose-D Glaxo.

GLAXO LABORATORIES LIMITED GREENFORD, MIDDLESEX ENGLAND

Subsidiary companies and agents in most countries.

INTESTINAL PAIN
RELIEVED
WITHOUT
SIDE-EFFECTS

'Merbentyl' is free from the unpleasant side-effects (drying of the mouth, blurred vision, etc.) normally encountered with both natural and synthetic anticholinergic agents. Its specific action on the gastro-intestinal tract makes it the spasmolytic of choice for the relief of pain in peptic ulcer and similar organic conditions. In addition, it is outstandingly successful for NERVOUS DYSPEPSIA.

'MERBENTYL' tablets are economical — basic daily cost to the N.H.S. is no more than 7d.

MERBENTYL REGD.

In tablets and as a syrup, each tablet or 5 c.c. syrup containing 10 mg. diethylaminocarbethoxybicyclohexyl hydrochloride.

MERBENTYL
with **Phenobarbitone**

in tablets and as a syrup, each tablet or 5 c.c. syrup containing 10 mg. 'Merbentyl' and 15 mg. (gr. ¼) phenobarbitone.

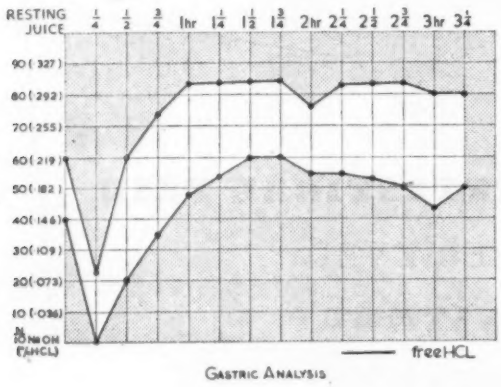
For conditions requiring sedation in addition to antispasmodic therapy.

Merrell

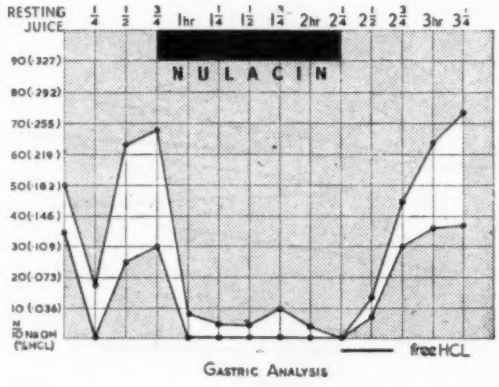
'MERBENTYL' and 'MERBENTYL' WITH PHENOBARBITONE *are distributed in the United Kingdom and Eire by*

RIKER LABORATORIES LIMITED · LOUGHBOROUGH · LEICS.

for the Wm. S. Merrell Company, London



GASTRIC ANALYSIS



GASTRIC ANALYSIS

In the treatment of peptic ulcer— safe, simple, effective, without side effects

NULACIN

provides milk-alkali drip therapy

A most effective control of gastric acidity is by milk-alkali drip therapy; the most convenient way of obtaining milk-alkali drip therapy is by sucking Nulacin tablets.

peptic ulcer in the ambulatory patient

Nulacin is of great value in the treatment of peptic ulcer in the ambulatory patient, and in the prevention of ulcer relapse.

clinical trials in three continents

Extensive clinical work has confirmed the claims made for Nulacin. References to some studies appear below. Other references will be given on request.

Nulacin tablets are not advertised to the public, have no B.P. equivalent and may be prescribed on E.C.10. The dispensing pack of 25 tablets is free of purchase tax. Basic price to N.H.S. is 2/-. Also available in tubes of 12.

Nulacin is available throughout the British Commonwealth, in the U.S.A., and in many other countries. It is known as Nulactin in Canada and Sweden.

HORLICKS LIMITED

Pharmaceutical Division, Slough, Bucks.

SELECTED REFERENCES

Antacids, *The Practitioner*, January, 1957, **178**: 43

Antacids in Peptic Ulcer, *The Practitioner*, January, 1956, **176**: 103

Ambulatory Continuous Drip Method in the Treatment of Peptic Ulcer, *Amer. J. Dig. Dis.*, March, 1955, **22**: 67-71

Further Studies on the Reduction of Gastric Acidity, *Brit. Med. J.*, 23rd January, 1954, **1**: 183-184

Clinical Investigation into the Action of Antacids, *The Practitioner*, July, 1954, **173**: 46

The Control of Gastric Acidity, *Brit. Med. J.*, 26th July, 1952, **2**: 180-182

3 essentials to sound clinical IRON replacement

In post-haemorrhagic states; as a therapeutic or precautionary measure during and after pregnancy; in adolescents, old people and those of unsound dietary habits, Ferraplex B is ideal for iron-deficiency anaemias of all kinds.

1 It contains adequate FERROUS iron in a form yielding rapidly increased and sustained haemoglobin levels.

2 The supplements it contains—copper, complete vitamin B complex, ascorbic acid—ensure that not only the additional iron but that present in the diet is fully utilised for haemopoiesis.

3 It is extremely well tolerated by patients of all ages, even those who usually react unfavourably to unmodified doses of iron salts.

COMPOSITION

The average daily dose of six FERRAPLEX B tablets contains:

FERRI SULPH. EXSICC., B.P. . . . . 1 gramme
COPPER CARBONATE . . . . . 2 mg.
ASCORBIC ACID (Vitamin C) . . . . . 50 mg.
NATURAL VITAMIN B COMPLEX EXTRACT: 2 grammes
prepared from brewers' yeast and including
Aneurine hydrochloride (Vitamin B_1) . . . 3 mg.
Riboflavine (Vitamin B_2) . . . . . 6 mg.
Nicotinamide . . . . . 30 mg.
and all the other naturally occurring factors of the vitamin B complex.

Bottles of 50 *tablets :* 5/3*d* (*Retail*) ; 250 *tablets* 15/6*d* (*Basic N.H.S. price*).

FERRAPLEX B

C. L. BENCARD LTD · PARK ROYAL · LONDON · N.W.10.

The original Lente Insulins

NOVO

Novo Lente Insulin

Novo Semilente Insulin

Novo Ultralente Insulin

All available in 40 and 80 units per ml.

EVANS MEDICAL

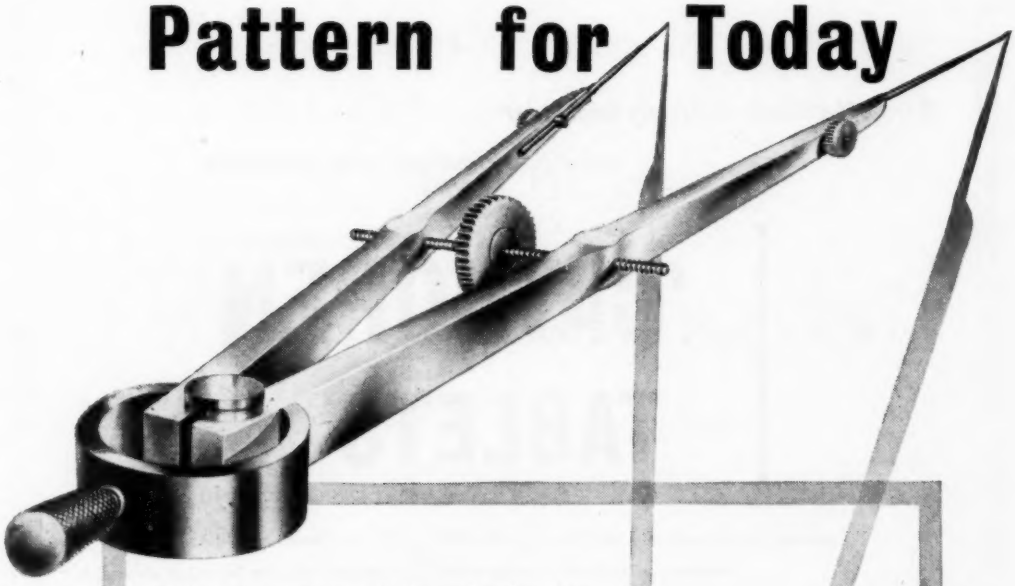
EVANS MEDICAL SUPPLIES LTD.

SPEKE, LIVERPOOL 19 (HUNTS CROSS 1881)

London Office: Ruislip, Middlesex (Ruislip 3333)

534

Pattern for Today



Today, the preference is for oral rather than parenteral treatment—provided it is as effective. Penicillin-V has precisely this advantage, giving clinical results consistently comparable with injectable penicillin. It achieves this end because, unlike penicillin-G, it is remarkably stable in gastric secretion. Penicillin-V gives higher blood levels than other oral penicillins and is more potent, dose for dose. When penicillin is indicated, let Penicillin-V-Lilly be the choice.

Average Dose:	125mg. (200,000 units) four times daily, increased in severe infections.
'Pulvules'	125mg. and 250mg.
Suspension	Paediatric 62.5mg. per 5cc.
	Also as Tablets and Suspension Penicillin-V-Lilly.

PENICILLIN-V-LILLY

Lilly

ELI LILLY & COMPANY LIMITED, BASINGSTOKE, ENGLAND

More effective in clinically important infections than any other antibiotic

TRADE MARK

'CATHOPEN' TABLETS

NOVOBIOCIN AND PENICILLIN G

Combines the dramatic *new* antibiotic 'CATHOMYCIN' with Penicillin G, the most widely used antibiotic ever developed; this alliance achieves the added advantages of both, while eliminating gaps in coverage presented by either antibiotic alone.

Compare these advantages

1. Proved effectiveness in the largest number of important infections including those caused by resistant *staphylococci* and *proteus*.
2. Therapeutic *bactericidal* blood levels are achieved rapidly.
3. Exceptionally well tolerated; sensitivity reactions are rare at recommended dosage.
4. No yeast or fungal super-infections or any antibiotic-induced enteritis, vaginitis or proctitis have been reported following 'CATHOPEN'.
5. No problems of cross-resistance have been encountered with 'CATHOPEN'.
6. The normal intestinal flora is not disturbed by 'CATHOPEN'.

Some important infections where 'Cathopen' is indicated

DOSAGE: *for adults*—two tablets q.i.d.; *for children under 100 lbs.*—dosage in proportion to weight (e.g. one tablet q.i.d. for a child weighing 50 lbs.).

How Supplied 'Cathopen' tablets are supplied in bottles of 16 and 100.
Each tablet contains:
'Cathomycin' (Novobiocin) . . . 125 mg.
Potassium Penicillin G . . 125,000 units

Basic N.H.S. Prices:
16's, 26/8d; 100's, 160/-d.

- Furuncles
- Recurrent and persistent carbuncles
- Breast abscess
- Whitlows and paronychiae
- Superficial skin infections
- Infected wounds
- Tonsillitis
- Pneumonia
- Acute otitis media
- Vincent's angina
- Bronchitis
- Cervical lymphadenitis
- Osteomyelitis
- Erysipelas
- Staphylococcal septicaemia and enteritis
- Cellulitis
- Urethritis

Literature gladly supplied on request

MSD MERCK SHARP & DOHME LIMITED, HODDESDON, HERTS

FOR OVER TWENTY YEARS

Roche

has been associated with the medical management of

MYASTHENIA GRAVIS

'PROSTIGMIN' for diagnosis and treatment

'MESTINON' for treatment

NOW IN 1957

as a result of continuous research in the Roche laboratories, another new compound has been introduced.

'TENSILON'

TRADE MARK BRAND

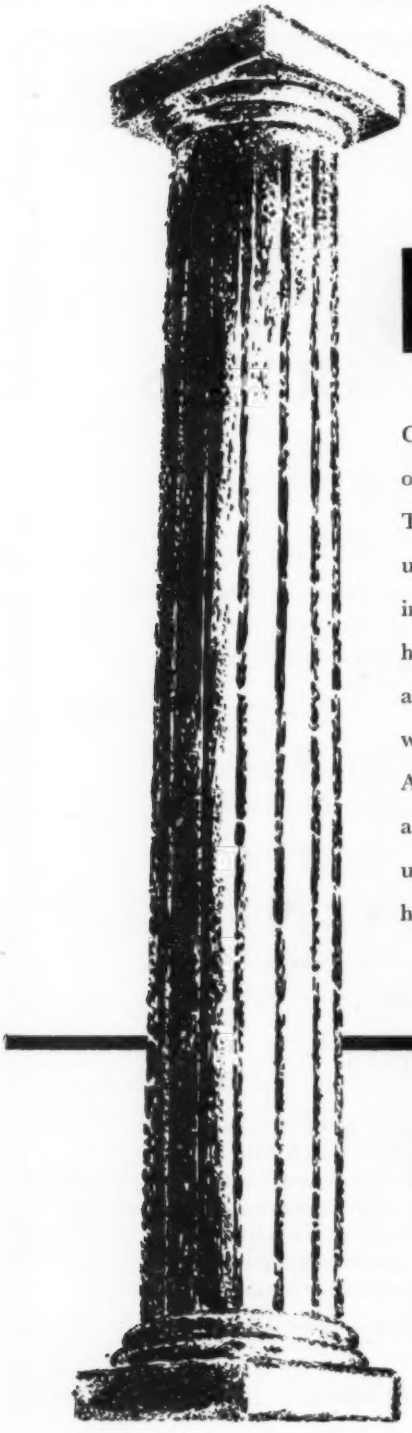
edrophonium chloride

for diagnosis

'Tensilon' is a short acting cholinergic compound. Its action is much more rapid and much shorter than that of 'Prostigmin'. Used as a diagnostic test for myasthenia gravis it gives clear-cut results in a few minutes. The response to 'Tensilon' can also be used to estimate the optimum dose of 'Prostigmin' or 'Mestinon' for a particular patient.

'Tensilon' is available in ampoules of 1 c.c. containing 10 mg. edrophonium chloride in boxes of 6.

ROCHE PRODUCTS LIMITED · 15 MANCHESTER SQUARE · LONDON W.1



STANDING ALONE

Can a *single* therapeutic agent establish full mastery over a wide range of intractable conditions?
To this question, ACHROMYCIN tetracycline has undoubtedly provided the conclusive answer—for here, indeed, is the *self-sufficient* antibiotic. No other antibiotic has a broader antimicrobial spectrum. No other antibiotic—or combination of antibiotics—offers a wider measure of effective control. That is why ACHROMYCIN needs no added support in combating an impressive range of infections, and has won unqualified acceptance among doctors and hospitals throughout the world.

ACHROMYCIN*

* REGD. TRADE MARK — TETRACYCLINE

THE SELF-SUFFICIENT ANTIBIOTIC

Capsules · Ear Solution · Intramuscular · Intravenous · Ointment 3% Ointment (Ophthalmic) · Ophthalmic Powder Sterilized · Oral Suspension · Liquid Pediatric Drops · SPERSOIDS* Dispersible Powder Soluble tablets · Syrup · Tablets · Troches

LEDERLE LABORATORIES DIVISION *Cyanamid* OF GREAT BRITAIN LTD., London, W.C.2 Lederle

'LANOXIN'

THE NEW NAME FOR THE ORIGINAL

DIGOXIN

When we discovered Digoxin in 1930 we used no other name to distinguish it. In those days, there was but one Digoxin—that issued by B.W. & Co. Today, it has become necessary to provide prescriber, pharmacist and patient throughout the world with that safeguard which a trade mark imposes . . .

THAT TRADE MARK IS 'LANOXIN'

NEW TITLE	'Tabloid' BRAND Digoxin *BECOMES* **'Lanoxin' BRAND Digoxin, B.P. (compressed)** Solution of Digoxin 'B.W. & Co.' *BECOMES* **'Lanoxin' BRAND Digoxin Oral Solution**
NEW PRODUCTS	**'Lanoxin' BRAND Injection** (for intramuscular or intravenous injection). *Boxes of* 6 × 2 *c.c. ampoules, each containing* 0·5 *mgm.* **'Lanoxin' BRAND Digoxin Pædiatric Elixir** *Bottles of* 2 *fl. oz., containing* 0·05 *mgm. per c.c.*
NO CHANGE OF TITLE	**'Wellcome' BRAND Injection of Digoxin** **'Wellcome' BRAND Sterile Alcoholic Solution of Digoxin**

N.B. Whenever oral Digoxin is ordered 'Lanoxin' may be dispensed

BURROUGHS WELLCOME & CO. *(THE WELLCOME FOUNDATION LTD.)* **LONDON**

ready in a couple of shakes

for prolonged action

It's as simple as that to use Mylipen. Just two or three vigorous shakes of the vial and there you have a free-flowing suspension of procaine penicillin ready for injection. And once it is injected 1 cc. (300,000 units) of Mylipen will maintain a therapeutic level of penicillin for 24 hours in most cases. Thus it provides convenient and effective treatment for any infection for which a prolonged acting penicillin preparation is indicated.

MYLIPEN TRADE MARK

In vials of ten 1 cc. doses

GLAXO

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX BYRon 3434

for the relief of TENSION

'MYANESIN' TRADE MARK

ELIXIR & TABLETS

Carefully controlled experiments have demonstrated that muscle tension is greater in anxious patients than in healthy persons. The more severe the symptoms of anxiety the greater is the tension in the muscles.

It is now becoming recognised

that many cases diagnosed as psychogenic rheumatism are in fact cases of anxiety-induced muscle tension and can therefore logically be treated with Myanesin Elixir and Tablets.

The suggested dosage is—One tablespoonful or two tablets four times daily.

Myanesin Elixir and Tablets are also valuable in the treatment of:—

Backache, Headache, Bronchial Asthma, Neurodermatoses, Dysmenorrhoea, Premenstrual Tension	One tablespoonful or two tablets four times daily
Insomnia, Nocturnal Cramp	One tablespoonful at night

'MYANESIN' ELIXIR
One gramme mephenesin in each tablespoonful
Bottle of 8 fl. oz. 4/6 Bottle of 40 fl. oz. 18/6

'MYANESIN' TABLETS
Each containing 0.5 gramme mephenesin
Bottle of 50 at 6/10 Bottle of 500 at 56/-
Basic N.H.S. prices

THE BRITISH DRUG HOUSES LTD. LONDON N.1

SOME PRINCIPLES OF PSYCHOTHERAPY IN GENERAL PRACTICE *

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SOME psychiatrists think that nothing is achieved by giving lectures or short courses on psychotherapy. I do not share this view. Psychotherapy is neither a purely intuitive art, which depends entirely on the personality of the doctor, nor something so esoteric that it can be undertaken only by trained psycho-analysts. Though long and specialised training is necessary for some types of analytic psychotherapy, many useful techniques can be acquired and used in general practice.

The bulk of straightforward psychotherapy is already done in general practice, and this is likely to continue, to the betterment of general practice and psychiatry. Not every neurotic or "functional" disorder needs specialist attention. Many patients are frightened by being sent to a psychiatrist, and some refuse clinic appointments for this reason. Hence the general practitioner has to practise psychotherapy, in one form or another, whether he likes it or not. The problem is to make this form of treatment more effective and widely applied.

Psychotherapy remains an art, and has so far eluded study by accepted scientific methods; it contains no absolute truths. Nevertheless there is a body of principles that can be learnt and applied to its practice.

Before embarking on some of these principles I want to explode a few of the *misconceptions* that surround it. The first is that this treatment is too time-consuming to be undertaken in general practice. This is true of analytical psychotherapy, but not of the many simpler methods. The second is the fable of the buried treasure—the idea fostered by films and books that a single traumatic episode buried in the patient's past caused the condition, and if the doctor can dig it up all will be well. One does not have to practise psychiatry and psychotherapy very long to know that this is true of very few patients. The third misconception is that an extensive knowledge of psychodynamics is needed. In point of fact much effective psychotherapy is done without recourse to the unconscious mind and without speculations about repressed conflicts and motivations. Indeed, too much sophistication in mental mechanisms, and too little common sense, may be a positive hindrance to success.

What is Psychotherapy?

Broadly speaking, any form of treatment designed to produce a response by its mental rather than its physical effects is psychotherapy. Such treatment falls into two groups. The first (which has been aptly called bedside manners or "prescribing the doctor") uses suggestion, persuasion, re-education, reassurance, and support. It includes managing the patient's problems and bringing about changes in circumstances which are noxious to him. This kind of psychotherapy is most suited to general practice.

The second group are the so-called deeper forms of psychotherapy, which often aim at uncovering psychological conflicts of which the patient is unaware, and relating them to his problems. This group includes such special techniques as hypnosis, abreaction, and psycho-analysis, which are best left to those with special knowledge and experience.

* Based on a paper read at a weekend course on Psychotherapy in General Practice organised by the Board of Graduate Studies, University of Birmingham, in conjunction with the Midland faculty of the College of General Practitioners and held in the Uffculme Clinic on Sept. 15–16, 1956.

History and Examination

History-taking

Unless the patient is already known to the doctor, history-taking constitutes the first interview, and first impressions are very important for both patient and doctor. Not infrequently the taking of a fairly detailed life-history is all that is needed to get the patient better. The opportunity to ventilate his problems with a sympathetic listener may previously have been denied him.

The important thing in history-taking is the *attitude of the doctor*. The key to a successful history is to be able to convey to the patient that one has plenty of time and is sympathetic and interested in his problem. One can learn to convey this impression to the patient even if one is short of time and not particularly interested. The technique I adopt is to allow the patient several minutes to say anything he wants, unprompted and uninterrupted, before proceeding to any special line of inquiry. Much of what the patient says may seem trivial and irrelevant but he must get the feeling that he has had a chance to say what he wants.

Besides the maxim "It's not what you ask but how you ask it," certain other points deserve mention. We all face the problem of being selectively deaf in history-taking: we hear only the things we want to hear. To approach every neurotic with a fixed idea that the problem must be sexual is as naïve as to suppose it never is.

One should avoid direct reassurance too early in the history even if the patient asks for it. Too quick reassurance is as unconvincing as that of the motor mechanic who says there is nothing wrong with the engine without so much as taking a look under the bonnet.

One can often see the key to the situation by watching the patient's expression of emotion during the examination. He may tremble with anxiety, burst into tears, or flush with anger when talking about people or situations which affect him closely. Likewise silence or evasion of a particular topic may be significant. It is unwise to press questions if the patient does not seem ready to answer them. Some neurotics have great difficulty in talking about their troubles; so the doctor should not be surprised or disappointed if the real problem does not emerge in the history. With tact and patience it will emerge later when the patient feels secure with the doctor. Be suspicious of the patient who produces intimate material on a plate at the first meeting—he may be near psychotic.

I have always found it a good plan to round off the history by asking the patient what he himself thinks is the trouble and how he thinks he may be helped to get better.

Physical Examination

The examination can be made an important adjunct to psychotherapy. The ideal time and place to reassure a patient is during and immediately after physical examination. If allowed to do so, a patient while being examined will often reveal information that he previously forgot or feared to mention.

An examination which is excessive is as dangerous as one which is cursory. An intelligent patient is not likely to be convinced there is nothing physically wrong if one only looks at the tongue and feels the pulse; but where neurosis is suspected, the greater danger is of too protracted an examination, too many special investigations, and indecisiveness about the results. It is highly important to get the physical side of the case cleared up right at the outset, and not to reopen it without definite indications: if one later yields to the patient's request for further physical investigation, his confidence is bound

to be shaken. It is equally important to tell the anxious patient in very definite and simple terms the results of the physical examination.

Quite a number of emotional illnesses are precipitated or perpetuated by the doctor quite unwittingly. We are all guilty of contributing at times to these iatrogenic neuroses. Every psychiatrist sees patients who have been in the hands of three or four different specialists, all of whom are said to have told the patient something different. Such patients are hard to treat because they have lost faith.

If special investigations are pursued for several months the neurotic patient is bound to be influenced unfavourably. Moreover, laboratory studies are fallible and there is the oft-quoted risk of placing too much weight on minor variations. The sooner one has the courage of one's conviction that there is nothing physically wrong, and tells the patient so, the better. Neurotics are very keen to have a definite cause for their symptoms and will fasten like leeches on to "fibrositis" or the like as the cause of their troubles. Once they are fixed in this sort of belief it is much harder to get them well.

If the patient is determined to have some special investigation, it is probably best to get it over and done with straight away—but on the understanding that it is to settle the issue and not be the prelude to a series of further tests. Our medical training makes us rightly afraid of missing hidden physical disease, but it makes us insufficiently aware of the danger of creating invalids by doubts and indecisiveness.

I must emphasise, too, that emotional disorders should not be diagnosed by the exclusion of a suspected physical cause. Their diagnosis must be based on the positive finding of an emotional disturbance in the patient.

The Therapeutic Interview

In most forms of psychotherapy an interview with the patient is the main vehicle of treatment. These methods have the common factor that they depend almost entirely on communication between patient and doctor. This communication may be spoken, or it may be implied by means of expression and gesture. There are no rigid rules, but some general principles of the therapeutic interview deserve consideration.

Number, frequency, and duration of interviews.—Many emotionally sick people can be adequately treated in half a dozen interviews or less. Some need many more, but I doubt the practicability of long-term psychotherapy (except of supportive type) in general practice. Weekly interviews are better than monthly, for long intervals make the treatment too diffuse to be effective. Forty minutes is long enough for most patients, though many will do very well with twenty. Some anxious patients cannot tolerate talking to the doctor for more than ten minutes or so.

Situation and flexibility.—Psychotherapy is traditionally depicted with the patient lying on a couch. Though this is regarded as essential for psycho-analysis, the face-to-face interview is better for less intensive treatment. Flexibility is a very important principle of psychotherapy, but it is not identical with vagueness. The standard method must be tailored to individual needs. The same technique will not fit both the managing director and the semi-literate man who sweeps the floor in his factory.

Objectives and errors.—Before embarking on treatment it is important to decide the objectives for each case; they should be kept in mind throughout treatment. The aim may be to get the patient symptom-free, to give him some relief, to get him back to work, to save his marriage, or to keep him going until circumstances take a turn for the better. The aims should be realistic. Many doctors get discouraged about their therapeutic ability by putting the sights too high. Our influence on the patient is considerable but not infinite.

Though there are plenty of mistakes to be made in psychotherapy, one should not be put off by fear of making them. Many of the errors can be corrected. Psychotherapy is not as dangerous as some make out. A common mistake is to use such clichés as "Don't worry," "Snap out of it," and "Pull yourself together." There is nothing a neurotic resents more than being told to pull himself together; he has been told this many times and has told it to himself before he saw the doctor. In most cases such admonitions convince the patient that the doctor does not understand him. Nor should one tell him that his troubles are purely imaginary; symptoms are always real to the patient.

Avoid giving advice unless you are confident your counsel is correct and will do no harm. This applies to patients who ask for advice as well as those who do not. It is generally a mistake to tell a patient to marry, to have a baby, or to change a job—in vague expectation that this is the solution of his difficulties. The new responsibilities often create additional problems. If the patient presses for advice, it is best to discuss the matter fully and help him to *reach his own decision*. If you give concrete advice be prepared to have it thrown back at you later.

Avoid prejudging the patient and his problems. Though one should try to feel with the patient, do not become so identified with his problems that you make him do what you would have done in his particular circumstances. Patients are individuals with their own aims and objects. The Pygmalion approach is almost always mistaken; the therapeutic subject is not clay to be moulded according to the doctor's ideals.

Timing, Minimal Activity, and Focus

The factors causing a patient's symptoms may be obvious after one interview; but, though very tempting, it is unwise to tell the patient all you know. Premature interpretation of the situation, even if it is correct, will be rejected. Unpleasant truths take time to be accepted. Correct timing here is as important as in glass-blowing, where attempts to mould the material before it is at the right temperature may fracture it or cause it to run. The patient should be led by inference into seeing the situation for himself without being told directly. Self-made interpretations are more likely to be accepted than those made by others.

Patients will rarely benefit from a lecture or sermon. The aim should be to get the patient to do the talking. The less active the doctor the better. Keeping one's mouth shut is probably the hardest psychotherapeutic lesson to learn. One should not be afraid of saying little or nothing, or of pauses and silences. If we start to talk as soon as the patient dries up, the conversation will probably remain on a very superficial level. Half the art of psychotherapy is to be a good listener. Conversational grunts, and exclamations such as "uh huh" and "humm" which lack an air of finality, help to keep the patient talking without interrupting him. One's facial expression, intonation, and gestures can all help to keep the conversation going. If the patient comes to a halt, one can often get him talking again by repeating one of the last phrases or words he spoke. If he dries up completely one can discuss why he has difficulty in talking.

Some patients are evasive and become more so when discussing their real problems. They tend to be repetitive and to circle round and round the topic of their symptoms. By showing lack of interest when they talk of symptoms, and interest when they start to talk of something else, one can get them to focus on matters of importance. In short-term therapy it is quite legitimate to select important topics and ask the patient to talk about them, but leading questions, and those with the answer yes or no, should be avoided.

It may be a good plan to start treatment by a brief explanation of its aims, thus preventing the patient from expecting too much of the doctor and too little of himself. The patient must see the treatment as a coöperative effort.

Some patients have a fixed idea about the way in which they can be helped, and one can prevent blunders by finding out about this. They may have great faith in some particular nostrum, and if so one should be aware of it. It may, for instance, be good psychotherapy to prescribe a placebo. Many patients, particularly from the lower social strata, have so accepted the tradition of the "bottle of medicine" that if one resolutely refuses to prescribe any medicine with psychotherapy they will not come again. A small prescription may ensure the initial coöperation necessary for psychotherapy. This does not mean that the doctor should always heed a patient's wishes or become a pawn for him to manipulate. The doctor should remain in discreet control of the treatment situation throughout.

The Doctor-patient Relationship

Most psychiatrists agree about the fundamental importance of the doctor-patient relationship in psychotherapy of all types. This relationship can be defined as the mutual interaction between the personalities of the patient and of the doctor that pervades all treatment. The relationship is not one-sided and shows a large number of variations.

For convenience it is easier to consider the two sides of the relationship separately, though in reality they are indivisible.

The Patient's Attitude to the Doctor

To the sick person seeking help, the doctor is not just another person. Even today the patient not only thinks of him as an accomplished expert in medicine and accords him his traditional and cultural rôle; he also sees him as a symbolic figure. Many emotionally sick people do not go to a doctor for help. Those who decide to seek help from medical sources differ in their attitude to the doctor from those who go elsewhere or nowhere at all.

Patients may exhibit positive or negative feelings of great intensity towards the doctor. Such feelings may be of awe, distrust, anxiety, warmth, hostility, or subservience. The type of reaction a patient shows to the doctor is determined more by the patient's personality and previous experience than the doctor's.

Some examples may help to explain. At one end of the scale are the patients with a really positive relationship with the doctor. They often come along with their minds already made up that you are a good doctor with almost magical powers to help them. They sing the doctor's praises even before anything has been done for them. They take his advice and treatment without a murmur. They even, to please him, say they are better, and are profusely grateful for the smallest attention. Such patients are good for the doctor's vanity and feeling of omnipotence; but they do not always persist in this attitude.

At the other end of the scale are the patients with strongly negative feelings about the doctor. They may be openly hostile, truculent, and aggressive, or, more subtly, they turn up late for appointments, fail to take the treatment prescribed, and do not discuss their problems openly. They are bad for the doctor's vanity and tax his patience to the utmost. The surprising thing is that they often continue to seek the doctor's help.

Between these two extremes we find the bulk of patients, who show mixed positive and negative feeling towards the doctor. Such patients' attitudes often fluctuate.

It is of fundamental importance to recognise that the patient's attitudes to the doctor are nearly always predetermined and *not personal* in any way. Some people may tend to repeat attitudes towards the doctor that have been laid down by previous life experience. In particular they tend to re-enact their childhood relationships with figures of authority such as parents and teachers.

The Doctor's Attitude to the Patient

An understanding of the doctor's part in the relationship is as vital as it is difficult. It is bound to be individual for each doctor and involves a certain amount of soul-searching and recognition of his own outlook and prejudice. Unfortunately, many a doctor cannot tolerate certain shortcomings in his patients—to the serious detriment of his ability to help them. Some doctors cannot tolerate stupidity; others cannot take the patient who is surly and hostile or one who is coy and flirtatious. Certain attitudes in our patients threaten us or annoy us, and we should recognise this. Each of us has his own emotional blind-spots, and I do not think we can be all-round psychotherapists unless we are aware of these and how they affect our handling of patients.

It is relatively easy to be a good psychotherapist with certain types of patient suited to our own make-up; the difficulty is to be able to help more than an isolated group of emotionally sick people. A doctor who can learn to tolerate his patient's emotions, in the same way as he learned to tolerate pathological specimens without disgust, has gone a long way towards being an effective therapist.

If we are hostile and annoyed with our patients we cannot get their confidence and coöperation; through lack of empathy the therapeutic relationship does not develop. Doctors who regard all neurotic patients as weak and spineless are not likely to help them.

We all tend to develop defences against our patients, some open and some more hidden. We can of course dub them straight away as "another damn neurotic," or show our dislike more subtly by sending them at once to a specialist for protracted investigation, or abroad for a long holiday. Our letters about the patient often express our feelings well; the adjectives used often tell more of the doctor's feeling than the patient's condition.

Learning psychotherapy does not mean learning a new series of catch phrases; but the technique does involve an awareness of the importance of our own response to the patient and how this influences our ability to deal with his psychological problems.

Finally, I would emphasise again the importance of first impressions. If the doctor is sympathetically warm and accepting at the outset, he can build up the good relationship with the patient which is so important. If, later, the patient has to be dealt with in a more firm and positive manner, it can be done on the basis of the patient's confidence in the doctor and in a way he can more readily accept.

"A celebrated authority on Canon law and mediæval Universities, Dr. Hastings Rashdall, was one of those who could ride, but not understand a bicycle. One day, for example, having had a puncture in his front tyre, he was found vigorously pumping up the back one; when a passer-by pointed this out to him, he remarked, 'What? Do they not communicate?' I sometimes wonder whether, in our present-day eagerness to 'put people in the picture,' we do not behave rather like Dr. Rashdall, strenuously pumping in information at one end of a firm in the hopeful expectation that it will find its way to the other. Perhaps we too ride but cannot understand."—T. M. HIGHAM, *Occupational Psychology*, January, 1957, p. 1.

INTERMITTENT ALDOSTERONISM IN PERIODIC PARALYSIS

DEPENDENCE OF ATTACKS ON RETENTION OF SODIUM, AND FAILURE TO INDUCE ATTACKS BY RESTRICTION OF DIETARY SODIUM *

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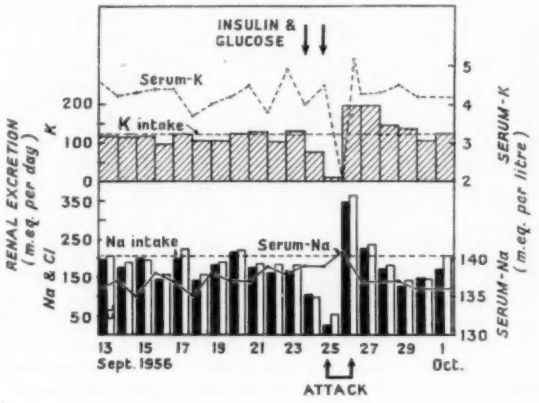
WE have reported that spontaneous attacks of periodic paralysis are preceded by large increases of urinary aldosterone and by intense retention of sodium (Conn et al. 1956). This is followed shortly by sequestration of potassium within the body, both serum and urinary potassium falling abruptly and intensely. Serum-sodium often rises to abnormally high values as serum-potassium reaches its lowest ones. As the attack subsides a great diuresis of sodium occurs together with a less intense increase of urinary potassium. Serum-sodium and serum-potassium return to normal together. By this time urinary aldosterone has returned to base-line values.

We have explored further the rôle of retention of sodium in setting off potassium sequestration—i.e., acute hypokalæmia and hypokaluria. Two young men with the familial type of periodic paralysis were the subjects of this study. One of them, living in our laboratory, submitted cheerfully to 11 months of a rigid metabolic balance régime. The other was studied for 30 days to test in a different person the applicability of the metabolic principles discovered in the first one. The subjects are not related.

* This study has been supported by a grant from the office of the Surgeon General, Medical Research and Development, U.S. Army.

† Howard Hughes Foundation investigator.

The aim of this short communication is to disseminate quickly information which is of immediate practical value to patients with this disorder. Extensive data will be published later. At this time we wish merely to outline some of our results and conclusions.



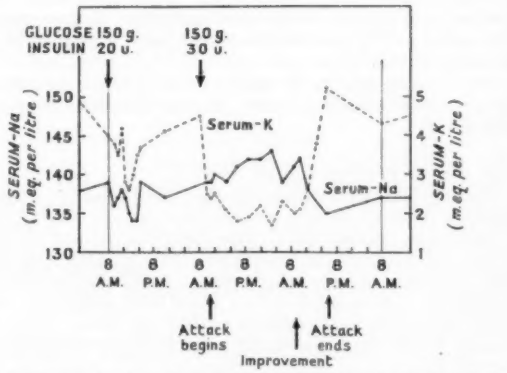


Fig. 2—Changes in electrolyte metabolism during episode of periodic paralysis induced by administration of glucose and insulin.

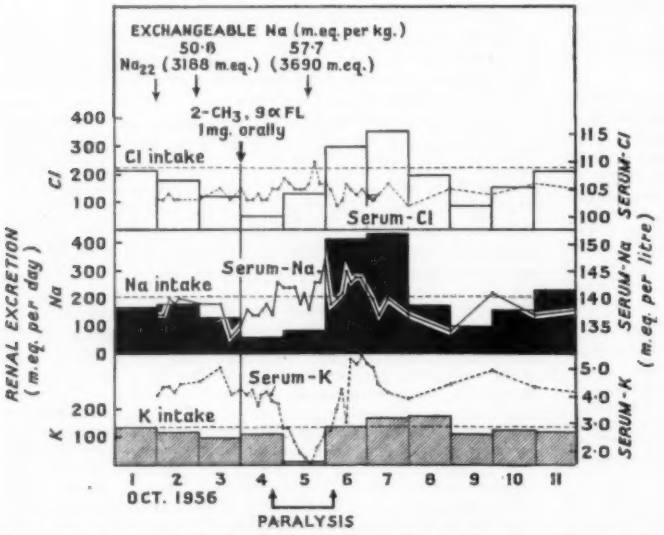


Fig. 1—Induction of episode of periodic paralysis by 2-methyl-9-α-fluorohydrocortisone and high sodium intake.

Method

Two levels of sodium intake were used—8 and 208 m.eq. per day. The composition of the daily ration was otherwise the same, the high sodium régime differing from the low by addition of sodium chloride to the basic diet. Chloride ion, the only other variable, was 27 m.eq. per day on the low, and 229 m.eq. per day on the high, sodium ration. Potassium intake was constant at 132 m.eq. per day.

Results

Under both of these dietary conditions a series of identical experiments were carried out, each designed to induce an episode of periodic paralysis. The following facts were disclosed :

(1) When the diet contained the larger quantity of sodium the administration of glucose and insulin, or of 2-methyl-9-α-fluorohydrocortisone (an extremely potent mineralocorticoid) produced complete (from the neck down) and prolonged (24–48 hours) paralysis (figs. 1 and 2).

(2) When glucose and insulin induce an episode of periodic paralysis the great

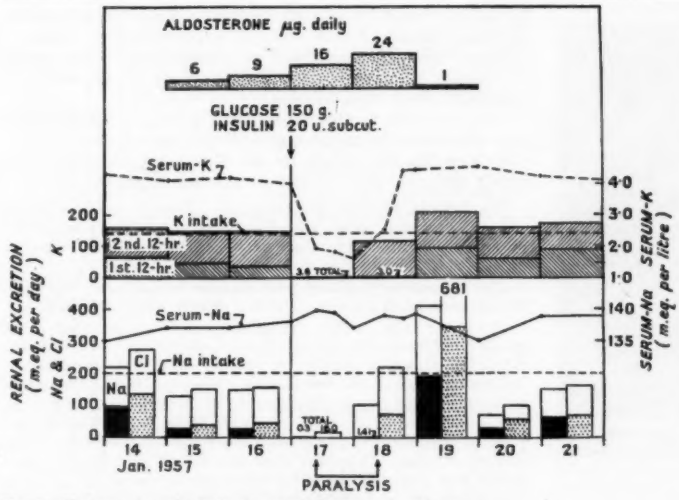


Fig. 3—Changes in electrolyte metabolism and urinary excretion of aldosterone during episode of paralysis induced by glucose and insulin. Lower part of histogram: first 12 hours; upper part, second 12 hours. Aldosterone estimated by method of Neher and Wettstein (1956).

retention of sodium which precedes the actual attack is accompanied by a sharp rise of urinary aldosterone (fig. 3). During the intense diuresis of sodium which follows an attack urinary aldosterone falls below normal. By what means increased utilisation of carbohydrate produces increased secretion of aldosterone in this disease is now under investigation.

(3) In all of these paralytic episodes urinary and serum K fell sharply but the sequestration of K was always preceded and then accompanied by intense retention of sodium.

(4) The very earliest return of muscle function is related temporally to increasing amounts of urinary sodium; and in some attacks it can be demonstrated that serum-potassium is still near its minimal value at the time that the ability to move muscles is returning. This is then followed by a rapid increase of urinary and serum potassium.

(5) Total body exchangeable sodium (Na^{22}) was found to be elevated before induction of attacks and this increased considerably during induction of an attack (fig. 1).

(6) When retention of sodium was prevented by provision of the diet very low in sodium, *attacks of paralysis could not be produced* by the procedures which had provoked the severe ones previously mentioned; and sequestration of potassium did not occur (fig. 4). This has been demonstrated in both of our cases of periodic paralysis.

(7) As in normal individuals, these subjects when taking the low-sodium diet exhibited persistently raised levels of urinary aldosterone, yet there were no attacks. Thus, the sudden sequestration of potassium which accompanies an attack of periodic paralysis is not due per se to the presence of aldosterone. Sodium must be available and must be retained in the body before potassium begins to move to its site or sites of sequestration.

(8) Whereas 2-methyl-9-α-fluorohydrocortisone produced prolonged retention of sodium and diuresis of potassium in normal men (fig. 5), it produced sodium retention followed by sequestration of potassium in both patients

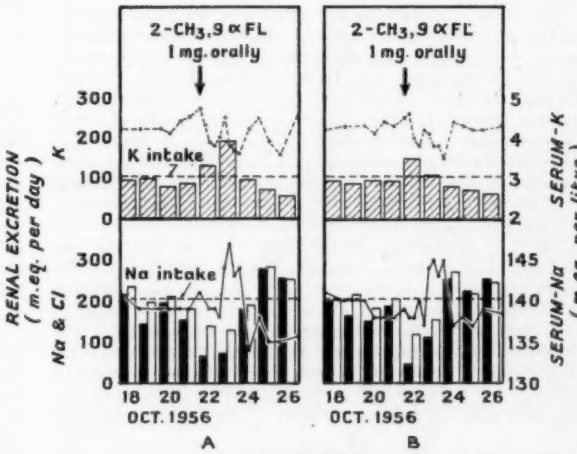


Fig. 5—Effects of 2-methyl-9-α-fluorohydrocortisone on electrolyte metabolism in two healthy young men aged 21 (A) and 19 (B).

with periodic paralysis (fig. 1). This would appear to rule out the possibility of production of an abnormal potassium-retaining adrenal steroid in this disease. Instead it appears that when a sodium-retaining corticoid is actively causing sodium retention in periodic paralysis the potassium response is a paradoxical one. This conclusion is strengthened by the fact that we have clearly identified as aldosterone the urinary sodium-retaining corticoid found in excess in this disorder.

(9) Skeletal muscle obtained during the period of high-sodium intake contains much too much sodium and a normal or slightly subnormal concentration of potassium (see accompanying table). Microscopically, the lesion characteristic of this disease is observed—namely, numerous large and small glistening vacuoles within muscle-fibres. The vacuoles do not stain as fat or glycogen (fig. 6).

(10) In skeletal muscle obtained after 44 days on the low-sodium diet this vacuolar change in the muscle-fibres has disappeared (fig. 6b). The accompanying table shows the values for concentration of Na and K in muscle at this time.

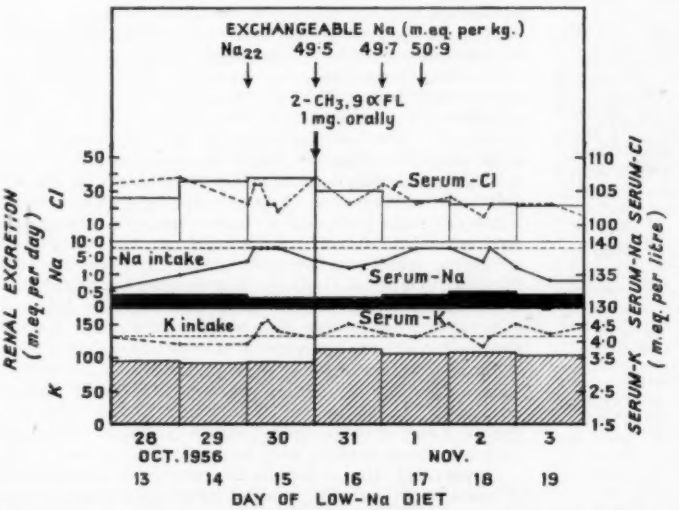


Fig. 4—Data indicating failure of 2-methyl-9-α-fluorohydrocortisone to induce attack when sodium retention is prevented by low-sodium diet.

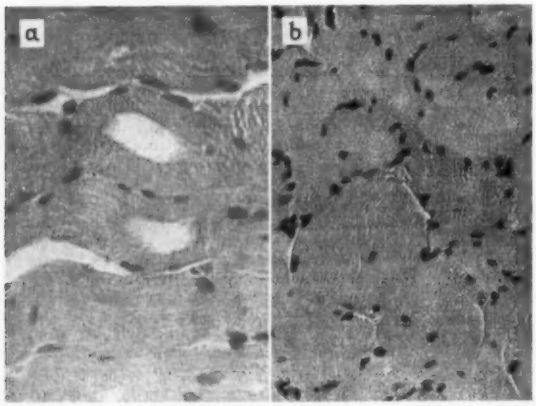


Fig. 6—Skeletal muscle from patient with periodic paralysis: (a) during high-sodium intake, showing vacuoles; (b) during low-sodium intake, showing no vacuoles.

Discussion

The dramatic decrease in the level of serum-potassium at the beginning of a paralytic episode in the "familial type" of periodic paralysis has resulted in extensive studies of potassium metabolism in this disease. Current therapy consists in administration of potassium salts daily by mouth as prophylaxis, and of potassium chloride intravenously for established attacks. We are impressed with the facts that, although an incipient attack can be aborted or a severe one sometimes ended by administration of potassium, they still occur even when 10–12 *g.* of potassium chloride is ingested daily.

Studies of sodium metabolism in this disease are meagre. In two studies sodium balance was found to be positive before and negative after the attack (Ferrebee et al. 1940, Danowski et al. 1948), but the significance of this finding was not appreciated. It is clear from the present data that the sudden and profound sequestration of potassium is always preceded by an intense positive balance for sodium. In normal individuals on very low levels of dietary sodium, urinary excretion of potassium is not increased by administration of 2-methyl-9-α-fluorohydrocortisone (J. W. Conn, unpublished). Thus, it appears that even in normal people the effects of mineralocorticoids upon potassium metabolism are secondary to retention of the sodium ion.

SODIUM AND POTASSIUM CONTENT OF MUSCLE AND SERUM IN PERIODIC PARALYSIS, HEALTH, AND PRIMARY ALDOSTERONISM

—	Date	Weakness	Paralysis	Muscle		Serum	
				Sodium (m.eq. per kg.*)	Potassium (m.eq. per kg.*)	Sodium (m.eq. per kg.)	Potassium (m.eq. per kg.)
Periodic paralysis:							
Case 1†	Oct. 31, 1955	+	+	48	82	137	4·0
,, ,,	Jan. 14, 1956	+	+	52	85	146	3·0
,, ,,	Mar. 10, 1956	−	−	46	75	139	4·5
,, ,,	Nov. 29, 1956§	−	−	34	74	135	4·1
,, ,,	Feb. 19, 1957‖	+	+	46	81	137	3·7
Case 2‡	Feb. 8, 1957	+	+	47	82	137	1·3
Healthy people:							
Shohl 1939				31	93	..	..
Farago et al. 1951				21	106	..	..
Baldwin et al. 1952				..	95	..	..
van Buchem et al. 1956				26–36	91–107	..	..
Primary aldosteronism:							
Conn 1955 (preop.)				49	62	144	3·1
Conn et al. (unpubl.) (18 mos. postop.)				32	76	141	4·1
van Buchem et al. 1956 (preop.)				52	68	..	..

* Expressed in terms of fresh wet weight.
† Male, aged 19.
‡ Male, aged 24.
§ After 44 days on low sodium intake plus initial desalting with acetazolamide ('Diamox') and mercaptomerin ('Thiomerin'). After 38 days on high sodium intake.

With respect to the *clinical* entity of periodic paralysis we call attention to several well-recognised discrepancies which make it difficult to correlate attacks of paralysis solely with an abnormality of potassium metabolism:

(1) Attacks of total paralysis may occur at levels of serum-potassium which when found in other conditions are not low enough to result in muscular paralysis (Darrow 1946, Danowski et al. 1949, Elkinton et al. 1951).

(2) The severity of different attacks in the same individual is not correlated closely with the degree of hypokalæmia.

(3) When the serum-potassium has been estimated frequently throughout attacks, we have often observed that muscular function begins to return while serum-potassium values are close to the lowest value observed during the attack.

(4) Sporadic cases (Watson 1946, Bull et al. 1953) and families (Tyler et al. 1951, McArdle 1956) exhibit the typical clinical syndrome without *any* decrease of serum-potassium during attacks. It seems very significant that in such cases Tyler et al. (1951) have found the vacuolar myopathy (a lesion characteristic of familial periodic paralysis [Goldflam 1897, Schmidt 1919, Zabriskie and Franz 1932, Allott and McArdle 1938]) which is demonstrated in fig. 6a and shown in fig. 6b to have disappeared with reduction of intracellular sodium toward normal.

All of these considerations viewed in the light of the experimental data described here, suggest that the common denominator is an excessive quantity of intracellular sodium. This by no means excludes hypokalæmia, when it occurs, as a contributory factor; nor does it mean that a sudden increase of intracellular potassium does not influence the onset of a paralytic attack. It does indicate, however, that retention of sodium is the primary factor which sets into motion the characteristic chain of events in an episode of periodic paralysis; and it provides a much more direct approach to the prevention of paralytic episodes.

Comparison of the sodium and potassium content of muscle in periodic paralysis and in primary aldosteronism (see table) suggests that when intracellular sodium is too high the muscle cell must be able to extrude potassium if paralysis is to be avoided. The sum of the intracellular cations may be a critical factor in the muscular paralysis. The mechanism by which in most of these cases retention of sodium under the influence of aldosterone sets off the potassium-sequestration phenomenon requires further study. Similarly, the mechanism by which intermittent aldosteronism exists in this disease is not yet clear.

It seems likely, then, that an abnormally high concentration of sodium within the muscle cell is partly responsible for the disturbance of muscle function in periodic paralysis. The histological lesion of this disease—i.e., hydropic vacuolisation within the muscle-fibre—is related to the high concentration of intracellular sodium, although total cationic concentration may be important. Since the same pathological lesion has been observed in patients who, although suffering from typical periodic paralysis, exhibit no hypokalæmia or hypokaluria during attacks (Tyler et al. 1951), it is probable that retention of abnormal amounts of sodium is the common factor in the various subgroups of periodic paralysis. Balance studies for sodium are needed in such cases.

From a practical point of view these studies indicate that a diet low in sodium prevents attacks of periodic paralysis. A period of "desalting" with mercurial diuretics and/or carbonic-anhydrase inhibitors, associated with a low-sodium diet, may be required as an initial step.

Apparently the stimulus for excessive secretion of aldosterone in periodic paralysis is extra-adrenal in origin. Although adrenalectomy would remove the source of aldosterone, we believe that this procedure is not indi-

cated because: (1) episodes of paralysis become less frequent and finally disappear as the patient grows older; and (2) replacement therapy, unless grossly suboptimal, would probably be associated with periodic retention of sodium, especially under conditions of stress (Ingle 1952).

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THE EFFECT OF TOLAZOLINE HYDROCHLORIDE ON TIC DOULOUREUX

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IT has long been recognised that attacks of tic douloureux may be suppressed by vasomotor agents such as choline derivatives, nicotinic acid, histamine, and amyl nitrite (Cooper 1938, Adams and Robinson 1941, Karl et al. 1945, Wolff 1948). Such effects, even if temporary, provide a line of therapeutic investigation and are of interest in the study both of the disease and of the pharmacology of the agent used. In this field the action of more recent and possibly more effective vasodilator agents appears little explored, and this report presents some experiences with tolazoline hydrochloride. The aim has been to determine the existence and characteristics of any effects rather than to establish an optimal therapeutic régime.

Material and Methods

Observations were made in 9 patients with tic, 2 of whom had disseminated sclerosis and 1 an acoustic neuroma. 3 had had alcohol injection years previously. Only unequivocal cases of tic were accepted. Patients with frequent daily pains and active trigger areas but without severe cardiovascular disease were selected. Most of them were awaiting surgical treatment, which was delayed only in some instances where the response seemed especially promising. Tolazoline hydrochloride ('Priscol,' Ciba) was usually given first orally (12·5 mg.) as a test for idiosyncrasy, and in 1 case this route alone was used. However, graduated intravenous administration (up to 50 mg. in 10–15 minutes) was preferred so that observations could be made over a short period, thereby minimising errors from fluctuations in clinical state. Peripheral vascular responses were assessed by subjective flushing and by objective changes—e.g., conjunctival suffusion and changes in skin colour and temperature (measured with Marks skin thermometers on the extremities). The patient was kept resting flat during intravenous tests, and the blood-pressure and pulse-rate were noted at intervals.

The effects on the tic were judged by the number of attacks and their ease of provocation, both with ordinary activity (talking, eating, &c.) and with deliberate stimulation of the trigger area (touching, rubbing) before, during, and after administration of the drug. It was, however, considered unjustifiable to activate deliberately trigger areas repeatedly during the course of an injection to determine the precise temporal relationship between the peripheral vascular effects and relief of pain; so this was not closely defined.

Results

8 patients were given tolazoline intravenously, and in 6 there was a dramatic cessation of attacks and inactivation of trigger areas, persisting for some hours; but in 2 there was little definite change. In 5 of these patients (3 responding and 2 resistant) further intravenous tests were possible (after at least 48 hours' interval) and gave similar results. Of the 2 showing no remission with intravenous therapy one was subsequently found to have an acoustic neuroma and the other showed smaller peripheral vascular responses than usual. The final case in the series was treated only orally and went into a remission for 4 months.

Illustrative Case-reports

Case 1.—A woman, aged 66, with tic affecting the second and third divisions of the right trigeminal nerve for 18 months. She had had numerous increasingly severe attacks daily for many weeks when first seen, most of them coming on spontaneously, trigger areas being inconstantly active. Her blood-pressure was 190/90 mm. Hg. Oral tolazoline 25 mg. t.d.s. produced subjective flushing and immediate reduction in the number and severity of her attacks, and at higher dosage (50 mg. t.d.s.) the attacks ceased entirely in 2 days, the patient remaining pain-free under this régime for nearly a week. At this point inert tablets were substituted, and the pains promptly recurred, though not to their usual extent before therapy. Restoration of oral tolazoline did not control these pains as completely as before (nor was the flushing response so definite); but a single 50-mg. intravenous dose produced marked vascular responses and immediate complete freedom lasting 3 days. Over the next 2 weeks limited pains reappeared on three occasions, and on each 50 mg. intravenously produced immediate relief lasting some days without further therapy. The pains did not return after the final injection, and the patient has remained pain-free for more than 2 years without further treatment.

Case 2.—A woman, aged 52, with tic affecting the second and third divisions of her right trigeminal nerve for 16 years, treated 14 years previously by alcohol injection. She had had, for 3 weeks, numerous severe attacks daily, triggered consistently from gum and lip. Blood-pressure 140/80 mm. Hg. Intravenous tolazoline 25 mg. produced flushing and dramatic relief of both spontaneous and provoked pains. Within 10 minutes food could be chewed on that side and dentures inserted for the first time in 3 weeks, the trigger areas being entirely inactive. However, 3 hours later slight tingling and soreness could be provoked from the trigger areas, and within 12 hours the pains had returned to some extent. Surgical intervention prevented further observations.

Case 3.—A woman, aged 51, with tic affecting the third division of her right trigeminal nerve for 8 years, treated on three occasions by alcohol injection. Numerous severe attacks had been occurring daily for 3 weeks, and oral trigger areas were acutely active. Blood-pressure 105/85 mm. Hg. An oral test dose of tolazoline 12·5 mg. was given, but the pains were so distressing that an intravenous injection was started without awaiting the oral response. 10 mg. intravenously unfortunately produced "bumping" in the chest, shivering, and numerous extra systoles, along with warming of the extremities. However, the attacks ceased, and within 25 minutes of the injection the trigger areas became inactive, and the face could be rubbed and food taken without incident for the first time in 2 weeks. The cardiac abnormalities subsided within 2 hours of the injection. Apart from one spon-

taneous attack several hours later, the patient remained pain-free for 2 more days without further medication. She had some tingling feelings of the type often heralding an attack, but they came to naught. On the 4th day she had a moderate spontaneous attack, and oral therapy was cautiously instituted (12·5–25·0 mg. t.d.s.). Over the next 3 weeks the trigger areas remained inactive, but she had moderate spontaneous pains every few days. These then increased, and occasional triggered pains reappeared. Higher oral dosage was not tolerated. A further intravenous injection again gave her 2 days of complete freedom with gradual return of first spontaneous and then triggered pains over the next week, whereupon root section was done.

Case 4.—A man aged 47, with disseminated sclerosis for 11 years and mild left-sided tic for 3 years. When first seen he had been having pains daily for some weeks with numerous severe paroxysms for the past 3 days; trigger areas were well defined. Blood-pressure 155/100 mm. Hg. Intravenous tolazoline 50 mg. inactivated the trigger areas, but limited spontaneous attacks recurred $1^1/_2$ hours later, and therapy was continued orally (50 mg. t.d.s.). Under this régime the next 2 days were pain-free, but mild spontaneous pains returned again, and the trigger areas could not always be treated with complete indifference. However, under continued oral therapy this again subsided, and the patient had weeks of freedom with only an occasional minor attack. Therapy was stopped after 3 months, and inquiry 1 year later revealed no evidence of relapse.

Discussion

These results indicate that tolazoline may, like nicotinic acid, histamine, &c., suppress the paroxysms of tic. Such effects may be due to relief of nerve ischæmia and thus support the view that there is an ischæmic factor at some stage in the mechanism of some types of tic. Triggered attacks seem more readily suppressed than spontaneous, and, even when the pain is abolished, the involuntary twitch of the facial muscles which often accompanies it may persist, as has been observed with other vasomotor drugs (Adams and Robinson 1941, Wolff 1948).

It is of interest that cases with disseminated sclerosis also respond, in view of possible vascular factors in its pathogenesis. The variation in therapeutic response may derive from individual differences in drug susceptibility or capacity for local vascular reaction.

The present series is too limited to show whether there is any significant difference between those cases responding and those that do not, but analysis of a larger series might prove of interest. The fact that relief may long outlast the expected time-course of the drug does not necessarily invalidate an anti-ischæmic explanation. Factors determining the fluctuating course and long remissions so characteristic of tic are ill understood, and it might be that a vasodilator response over a short or long period favours those biochemical states existing in a remission. Indeed the remissions following procaine nerve-block, incomplete alcohol-injection, and surgical operation leaving nerve pathways intact might also derive from the beneficial effects of the period of vasodilation they provoke.

Therapeutically the results in such a small series must be interpreted with great caution, as the history of tic shows, but it is evident that good temporary relief may be afforded. Moreover a period of normal function with vigorous stimulation of the trigger areas may favour stabilisation in this state. It remains to be seen whether prolonged oral or parenteral therapy with this or similar agents can induce more general and lasting results. Its simplicity and immediacy commend it as one approach that should not be overlooked.

Summary

The effect of tolazoline hydrochloride on tic douloureux was investigated in 9 severe cases, 2 associated with disseminated sclerosis.

In most cases both spontaneous and triggered pains were suppressed for varying periods after parenteral administration.

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BLOOD COAGULATION AFTER THE INGESTION OF SATURATED AND UNSATURATED FATS

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IT has been claimed that blood coagulation is accelerated by the feeding of fat (Waldron et al. 1951, Fullerton et al. 1953, O'Brien 1955, 1956). O'Brien (1956) has gone so far as to say: "That a fatty meal accelerates blood coagulation is now established." On the other hand, there are contrary opinions (Tulloch et al. 1953, Manning and Walford 1954, Hall 1956a).

Dietary fat has been said to be important in the genesis of atheroma (Keys 1952). It is also asserted that feeding of fats containing large amounts of unsaturated fatty acids reduces the serum-cholesterol (Kinsell and Michaels 1955, Malmros and Wigand 1955, Bronte-Stewart et al. 1956).

For these reasons it appeared to us to be important to re-evaluate the effect of feeding different types of fat on blood coagulation.

Material

All tests were done on patients in medical wards. They were convalescing from a variety of diseases—chiefly peptic ulcer, uncomplicated hypertension, infective disease (e.g., pneumonia, pyelitis, meningitis), skin disease, and cardiac and cerebral disease (including atheroma). Patients with uræmia, jaundice, or blood or bleeding diseases, and patients having anticoagulant or cortisone therapy or with cardiac failure of more than very mild degree were excluded. Patients were asked whether they would be prepared to take either a high-fat or a low-fat breakfast; those who consented were allocated to one or other group by random selection.

Methods

The meals given were:

(1) *Low-fat.*—This consisted of bread and jam, porridge, tea, and fruit. Sugar and skimmed milk were allowed. The fat content of the meal was less than 5 g.

(2) *Oil.*—Salad oil was given as a draught together with the low-fat breakfast. In the experiment where consumption of prothrombin in silicone tubes was measured, 90 ml. of a mixture of sunflower-seed oil and pilchard oil (iodine number 137) was used. In the remaining experiments, 120 ml. of sunflower-seed oil (iodine number 128) was given. These oils were especially selected because of their high content of unsaturated fatty acids.

(3) *High-fat.*—In the prothrombin consumption experiment, 4 patients received 180 ml. and 3 received 210 ml. of 40% cream, together with a low-fat breakfast. 7 additional patients received a breakfast containing 80 g. of fat (bacon and eggs, bread and butter, and cream). In all the remaining experiments the high-fat diet contained at least 100 g. of fat. This consisted of fatty bacon fried with one or two eggs, bread and butter, 60 ml. of 40% cream, and 180 ml. milk. Patients refusing bacon for religious reasons were given additional

butter and eggs. Each patient was carefully observed to see that all the diet given was consumed. A few baulked at the last pat or two of butter!

As far as possible an equal number of patients in each of the three dietary groups (usually two of each) were tested on the same day.

Blood Collection

All patients were fasted from 8.30 P.M., and "fasting" specimens of blood were collected between 8 A.M. and 9 A.M. the next day. Breakfast was then given, after which nothing was given by mouth until the final specimen of blood had been taken.

In the prothrombin consumption experiment, 20-gauge needles and all-glass dry autoclaved syringes were used. In the remaining experiments syringes were not used. 18-gauge needles were used alone, and the freely flowing or spurting blood was collected directly into the test tube. Blood obtained by imperfect venepuncture was not used.

Coagulation Tests

Lee and White coagulation-time in silicone tubes.—1 ml. of blood was placed in each of 6 (in some cases 20) test tubes ($3 \times {}^3/_8$ in.) in rapid succession. The tubes were left undisturbed for ten minutes and then each was gently tilted once a minute. The end-point adopted was that which permitted complete inversion of the tube. The coagulation-time recorded for each patient was the mean for all tubes.

Coagulation-time of recalcified citrated plasma (calcium-time).—Decalcified plasma was obtained by the use of 3·8% sodium citrate (one part in ten of blood) and centrifuging the blood as follows:

Slow-spun plasma: 1500 revolutions per minute (r.p.m.) for ten minutes.
Fast-spun plasma: 3000 r.p.m. for forty-five minutes.
Super-spun plasma was obtained from slow spun plasma by centrifugation at 15,000 r.p.m. for fifteen minutes.

Plasma was recalcified with an equal volume of M/40 calcium chloride. 4 tubes, and in some cases 16 tubes, were used for each test and the mean recorded.

Prothrombin consumption.—This was measured on serum from the siliconed Lee and White tubes and on recalcified citrated plasma as previously described (Merskey 1950). The result was expressed as an index as follows:

$$\text{Prothrombin consumption index} = \frac{\text{prothrombin-time of plasma} \times 100}{\text{prothrombin-time of serum}}$$

Thrombin generation in silicone tubes.—This was tested on single specimens of fast-spun plasma as described by O'Brien (1955). In this test the fibrinogen-time is the shortest clotting-time in any of the fibrinogen subsamples. The thrombin generation time is the interval which elapses between the recalcification of the plasma and the fibrinogen-time subsample tube.

Blood thromboplastin generation.—This test was performed as described by Biggs and Macfarlane (1953). Three components are required—(1) Platelets, (2) Alumina-treated plasma, and (3) Serum. Samples of two components from fasting patients were tested with fasting and postprandial high-fat meal samples of the third. (1) 4 batches of platelets from fasting and 4 from postprandial blood were tested. (2) A 1 in 5 and a 1 in 25 dilution of alumina-treated plasma, derived from three specimens of fasting and post-prandial blood, were tested. (3) Serum was obtained from 18 fasting patients. 9 were taking a low-fat and 9 a high-fat diet, and serum was obtained four hours later. This was stored at 37°C for twenty-four hours, diluted 1/10 in saline and stored at −20°C until tested.

Factor V.—This was measured by the corrective effect on the one-stage prothrombin-time of a 1 in 10 and a 1 in 50 dilution of citrated plasma on aged human oxalate plasma. Specimens of plasma were tested for factor v from patients fed low-fat, low-fat plus oil, and high-fat diets.

Factor VII.—This was measured in plasma and serum by the method of Koller et al. (1951). The same serum specimens were tested for factor VII as were tested in the thromboplastin generation test.

Accelerated one-stage prothrombin-times (stypven-time).—Russell-viper venom ('Stypven') was used diluted 1 in 20,000. Equal volumes of fast-spun plasma (or plasma diluted 1 in 4 with 0·85% saline), saline, stypven and M/40 calcium were incubated and the coagulation-time recorded. The calcium was added a minute after the stypven had been mixed with the plasma. A separate bottle of stypven (with the same batch number) was diluted for the fasting and postprandial experiments because the diluted stypven appeared to lose potency even if stored at 4°C. All tests were done in duplicate.

All coagulation tests were carried out at 37°C. Coagulation-times were recorded by technicians who were, as far as possible, ignorant of the results which might be expected for any particular test. For any test on any one patient, the fasting and later specimens were both tested by the same technician.

Statistical Analysis

The significance of change in the coagulability of the blood was estimated with Student's t test, and a level of probability assigned to the results for each experiment and each method of estimation of coagulability. This significance was measured in two ways:

(1) Each series was regarded as a single experiment of paired observations and a single value for each patient obtained for the difference between the fasting and postprandial blood samples. t was then calculated from the formula:

$$t = \bar{x}\sqrt{\frac{n(n-1)}{\Sigma x^2 - \frac{(\Sigma x)^2}{n}}}$$

where Σx is the sum of the values for the differences between fasting and postprandial blood in each patient, n the number of paired observations, and $\bar{x}$ the mean difference—$\bar{x} = \frac{1}{n}\Sigma x$.

From this value for t, a significance level was obtained (designated P_1) which indicates the probability that the mean of the differences is not significantly different from zero.

(2) The mean differences between the paired observations for patients fed a high-fat or oil meal were compared with the mean differences for patients fed a low-fat meal. A value for t was calculated using the formula:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{(S_1)^2}{n_1} + \frac{(S_2)^2}{n_2}}}$$

where $\bar{x}_1$ is the mean difference in the high-fat or oil series and $\bar{x}_2$ the mean difference in the low fat-series, and S_1 and S_2 the respective variance of the series indicated by the subscript.

From this value for t, a significance level was obtained (designated P_2) which indicates the probability that the differences in the high-fat or oil series are drawn from the same population of differences encountered in the low-fat series. This seemed a valid comparison to draw as there was no obvious sampling bias in allotting the type of meal to each patient.

P_2 then, takes into account any effects of a control meal and the variance of a controlled series of observations. It is a more stringent test of significance and may allow for a large number of otherwise uncontrolled circumstances. It may be argued that where the control series of preprandial and postprandial samples have not been shown to differ significantly they should be ignored. This is a valid argument and for this reason we have quoted both P_1 and P_2.

A value for P of less than 0·05 has been selected as a minimal significance level.

TABLE I—LEE AND WHITE COAGULATION-TIME OF WHOLE BLOOD IN SILICONE TUBES (MIN.). IN 12 TESTS OF THE LOW-FAT AND OIL SERIES, AND IN 14 OF THE HIGH-FAT SERIES, THE MEAN OF 20 TUBES WAS TAKEN AS THE COAGULATION-TIME. IN ALL OTHER TESTS 6 TUBES WERE USED

Diet	Low-fat		Oil		High-fat	
No. of patients	37		38		39	
	Fasting	4 hours	Fasting	4 hours	Fasting	4 hours
Mean	34·9	34·0	34·3	30·5	34·4	35·7
P_1	$> 0·4$		$< 0·01$		$> 0·4$	
P_2	..		$> 0·1$		$> 0·3$	

TABLE II—COAGULATION-TIME OF RECALCIFIED PLASMA SLOW-SPUN IN GLASS TUBES (SEC.)

Diet	Low-fat		Oil		High-fat	
No. of patients	25		26		25	
	Fasting	4 hours	Fasting	4 hours	Fasting	4 hours
Mean	154·0	142·2	145·8	149·8	150·9	141·8
P_1	> 0·05		0·5		0·2	
P_2	..		>0·05 (increase)		> 0·7	

Results

Lee and White coagulation-time.—The results of this test are shown in table I. The changes produced by oil appear to be significant on their own (P_1), but P_2 for oil is not significant.

Calcium-time of plasma (tables II–IV).—No significant changes are seen in the low-fat or high-fat series. The oil seemed to cause a lengthening of the calcium-time

TABLE III—COAGULATION-TIME OF RECALCIFIED PLASMA FAST-SPUN IN SILICONE TUBES (SEC.)

Diet	Low-fat		Oil		High-fat	
No. of patients	21		20		21	
	Fasting	4 hours	Fasting	4 hours	Fasting	4 hours
Mean	302·0	280·1	315·2	363·2	287·3	302·9
P_1	0·3		0·02 (increase)		0·6	
P_2	..		< 0·02 (increase)		> 0·2	

when measured on plasma fast-spun in silicone tubes. This was in marked contrast to the apparent shortening caused by the oil in the Lee and White test.

Prothrombin consumption (tables V and VI).—The amount of residual prothrombin is high in all these tests. Lipæmic plasma does not appear to consume more prothrombin during coagulation than the control specimens.

Thrombin generation in silicone tubes (table VII).—The means of all tests have been combined in fig. 1. No

TABLE IV—COAGULATION-TIME OF RECALCIFIED PLASMA SUPER-SPUN IN GLASS TUBES. IN 12 TESTS OF THE LOW-FAT AND OIL SERIES AND IN 14 OF THE HIGH-FAT SERIES, THE MEAN OF 16 TUBES WAS TAKEN AS THE COAGULATION-TIME. IN ALL OTHER TESTS 4 TUBES WERE USED

Diet	Low-fat		Oil		High-fat	
No. of patients	37		38		39	
	Fasting	4 hours	Fasting	4 hours	Fasting	4 hours
Mean	247·6	257·7	253·2	232·2	259·4	247·9
P_1	0·4		> 0·05		> 0·9	
P_2	..		> 0·05		> 0·1	

significant differences are to be seen in either of the series tested.

Blood thromboplastin generation.—No difference in activity in this test could be demonstrated between platelets, $Al(OH)_3$-treated plasma, or serum derived from either fasting or lipæmic blood.

Factor V.—No significant differences were found in factor-V activity in the three groups of patients tested.

Factor VII.—No significant differences were found in factor-VII activity in the two groups of patients tested.

Stypven-times (table VIII).—P_1 was significant with the high-fat diet, using both diluted and undiluted plasma, and with oil when using diluted plasma. When P_2 was considered, both high-fat and oil were significant in diluted plasma but not in undiluted plasma. Not only were the final results significant but there was considerable consistency in the results, the lipæmic (fat or oil) plasma having almost invariably a shorter stypven-time than the fasting plasma. These consistent results were in marked contrast to the inconsistent and highly variable results obtained in all the other tests used in this series of investigations.

Discussion

Our results do not confirm the claims that feeding of mixed animal and vegetable fats accelerates coagulation. Inconsistent results were obtained with all the tests used except when the stypven-time was measured.

TABLE V—PROTHROMBIN CONSUMPTION INDEX OF WHOLE BLOOD CLOTTED IN SILICONE TUBES

Diet	Low-fat		Oil		High-fat	
No. of patients	7		7		14	
	Fasting	4 hours	Fasting	4 hours	Fasting	4 hours
Mean	60·0	75·9	67·6	78·0	50·1	77·3

Some authors assess the results of all these coagulation tests in percentage of normal and speak of "overall coagulability." This would presumably mean adding the effect of fat or oil in the stypven-time test (where the results appear to be significant), to all the others (where the results are generally not significant). This, in our view, would confuse the results and add nothing of value.

Our choice of a "lipæmic" specimen four hours after the ingestion of fat may not have measured the greatest degree of the effect of fat and hourly specimens might have revealed a change in coagulation. But a large

TABLE VI—PROTHROMBIN CONSUMPTION INDEX OF RECALCIFIED PLASMA SUPER-SPUN IN GLASS TUBES

Diet	Low-fat		High-fat	
No. of patients	14		15	
	Fasting	4 hours	Fasting	4 hours
Mean	64·5	76·8	66·6	60·7
P_1	> 0·1		> 0·3	
P_2	..		> 0·05	

number of four-hour plasma samples were grossly lipæmic, and the coagulation tests in these were little different from those which were not obviously grossly lipæmic. Both Fullerton et al. (1953) and O'Brien (1955) claimed to have shown acceleration of coagulation at this time after food. Choice of a four-hour specimen cannot, we think, account for our failure to demonstrate changes in blood coagulation after fat ingestion.

All our tests were done on patients in hospital. Many other workers have used healthy people. We cannot deny the possibility that this is the reason for our failure to demonstrate an effect on coagulation, but we think it very unlikely. We took care to concentrate on con-

TABLE VII—THROMBIN GENERATION TEST OF RECALCIFIED PLASMA FAST-SPUN IN SILICONE TUBES

Diet	Thrombin generation time (min.)				Fibrinogen time (sec.)			
	Low-fat		High-fat		Low-fat		High-fat	
No. of patients	11		12		11		12	
	Fasting	4 hours	Fasting	4 hours	Fasting	4 hours	Fasting	4 hours
Mean	12·4	14·1	13·8	13·8	55·0	50·8	51·8	47·4
P_1	0·3		> 0·9		0·4		0·2	
P_2	..		> 0·3		..		> 0·9	

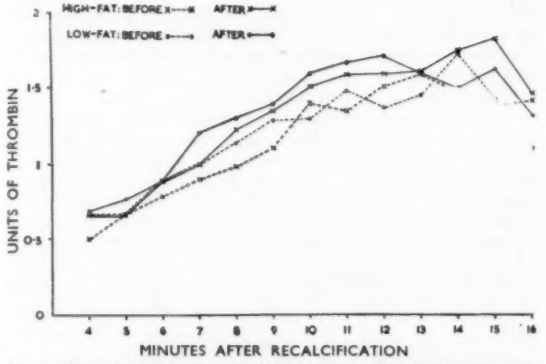

Fig. 1—Thrombin generation in silicone tubes. This figure represents the means of all tests in each series. The fibrinogen-time is represented by the amount of thrombin generated at the highest point of the curve. The thrombin generation time is the time that has elapsed from recalcification to this point of the curve.

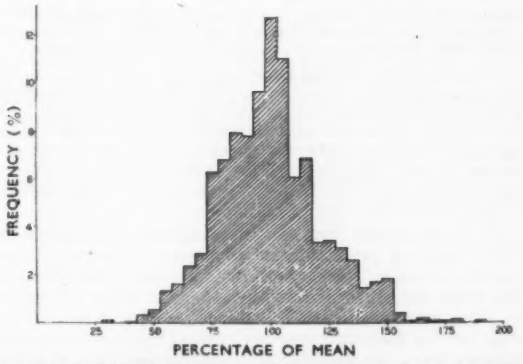

Fig. 2—Lee and White coagulation-time in silicone tubes: histogram of 1520 individual tube readings. The 20 tubes used in each test have each been expressed as a percentage of the mean for that test. The scatter is very wide.

valescent patients and to avoid patients whose diseases were known to be associated with abnormal coagulation or a bleeding state. It could even be argued that it is more important to know whether fat accelerates coagulation in people who are sick than whether it does so in those who are well.

TABLE VIII—ACCELERATED ONE-STAGE PROTHROMBIN-TIMES (STYPVEN-TIME) OF PLASMA FAST-SPUN IN SILICONE TUBES

Plasma	Diet	Low-fat		Oil		High-fat	
	No. of patients	21		22		22	
		Fasting	4 hours	Fasting	4 hours	Fasting	4 hours
	Mean	28·5	27·9	29·5	29·6	28·8	25·9
Undiluted	P_1	> 0·5		> 0·9		0·01	
	P_2	..		> 0·6		> 0·05	
	Mean	47·1	46·4	46·7	40·6	44·4	38·3
Diluted	P_1	> 0·6		< 0·01		< 0·01	
	P_2	..		0·02		0·05	

Excluding table VIII for the moment, it will be seen that there are no significant changes after a low-fat or a high-fat meal. The oil appears to shorten the clotting-time in the Lee and White test (table I) and to lengthen it in a calcium-time test (table III), while another variant of the calcium-time test shows no significant alteration. Both fat and oil shorten the one-stage prothrombin-time with stypven (table VIII).

Very few authors emphasise the uncontrolled variables in these coagulation tests. Even different tubes in the same test can give widely differing results. Many authorities advocate the use of 3 or 4 tubes in the test and tilt the 3rd or 4th tube only when the 1st and 2nd tilted tubes have coagulated. When this technique is used, blood in an untilted tube is occasionally found to have clotted by the time the tube is first tilted. No acceptable end-point would then be available. The error due to differences in individual tubes can be minimised by the use of 20 tubes in the test. The mean of these 20 tubes could then be taken as the best available estimate of the true coagulation-time. The degree of scatter is shown in fig. 2, where representative examples are shown of three types of result which have been encountered with about equal frequency.

Fig. 3 was derived from 76 such tests (1520 tubes), each tube-reading being expressed as a percentage of the mean. Only 26% of these tube readings fell with ± 5% of the apparent true mean. Somewhat similar observations can be made for readings of calcium-time. Thus it would appear at first glance that the insensitivity of the technique used would be the major obstacle in assessing the effects of food on the coagulation-time. Through the kindness of Mr. J. N. Darroch, of the department of mathematics of the University of Cape Town, we have been able to obtain a more detailed statistical analysis of the experiments where 20 tubes were used in the Lee and White test and 16 in the calcium-time test. His conclusions can be summarised as follows *:

Analysis of variance shows that the random variation in clotting-time between blood samples (by which is meant the residual variation when systematic changes from fasting to postprandial and from patient to patient have both been subtracted) is overwhelmingly larger than it would be if it arose simply from the variation within samples, that is from the insensitivity of the measuring technique. For the Lee and White coagulation-time it is 12 times larger and for the calcium-time 23 times larger. This completely contradicts one's first impression that the variation of readings within a sample is so large (coefficient of variation is 22% for the Lee and White coagulation-time and 17% for the calcium-time) as to destroy any possibility of detecting any systematic

* A full copy of the statistical analysis may be had in mimeographed form from the office of THE LANCET, 7, Adam Street, London, W.C.2.

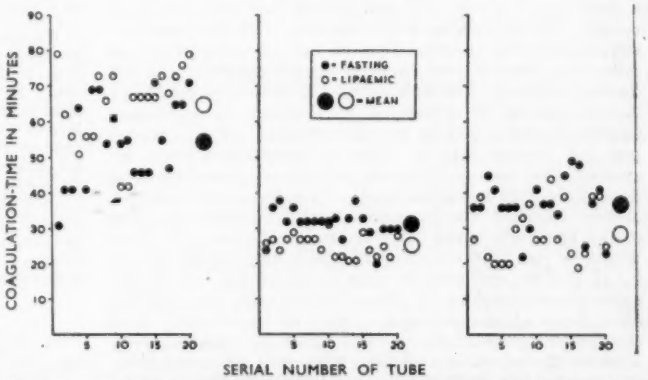

Fig. 3—Lee and White coagulation-time. Individual tube readings in 3 patients before and after a high-fat meal. The three diagrams represent widest scatter, least scatter, and intermediate scatter. The means are also shown.

changes in clotting-time. It now appears that the spread of readings within samples is having far less effect on the experiment than the uncontrolled variability between samples.

It is suggested that this latter variability may be accounted for in one (or both) of two ways. Firstly, that some artificial shortening of clotting-time is introduced when the sample is taken from the patient, and that this randomly affects some samples more than others. Secondly, that blood within a person has a clotting-time which randomly alters at different times to such an extent as to overshadow any change resulting directly from the content of a meal.

To us it seems that the most significant variable is the degree of perfection of the venepuncture. Technically imperfect venepunctures were always discarded. But there are unavoidable variations in what we regard as being acceptable for the purposes of the test. The time of the day, the weather, the taking of a meal as distinct from its fat content, and other variables too numerous to mention might also be implicated. Because of what has been said above and because of all these, we feel that we have been unable to show that fat materially alters blood coagulation when this is measured by the Lee and White or calcium-time tests.

Thrombin Generation Test

To obtain significant results with this test O'Brien (1955) found it essential to use platelet-poor plasma collected in silicone tubes. In this artificial system the generation of thrombin is slow, so it is not surprising that the plateau of thrombin generation is broad. This has been clearly shown by Pitney and Dacie (1953) and is obvious from fig. 1. It will be seen that very little thrombin is produced. Differences of 5–10 seconds at these levels represent only infinitesimal amounts of thrombin. Yet it is these differences that have to be used in this test to assess the effects of fat on coagulation.

We have also obtained negative results with tests which measure prothrombin consumption and thromboplastin generation. Our negative results with these tests confirm the findings of Manning and Walford (1954) and Hall (1956b). Only the results with stypven were consistent and reproducible.

We feel that the results of tests where fat is added in vitro should be distinguished from those where fat is added in vivo.

It is not difficult to show that fat added in vitro affects coagulation. Poole (1955) showed that fat shortened the coagulation-time. It has been shown that cream can abolish the prothrombin consumption defect of recalcified platelet-poor plasma (Merskey 1956). Macfarlane et al. (1941) demonstrated that cream could shorten the stypven-time. But none of these in-vitro tests should be regarded as proving an effect of alimentary lipæmia on coagulation.

In our hands the shortening of the stypven-time after a fatty meal is the only test which has given positive results. We agree with Fullerton et al. (1953) when they say that these findings "could not be interpreted as indicating that a real increase in coagulability occurs during lipæmia. The inference that naturally occurring thromboplastin is influenced by lipæmia in a manner similar to viper venom is not justified." Hall (1956a) put the matter into a different perspective when he showed that the acceleration of the stypven-time was important only in the absence of platelets, and that fat merely returned the lengthened stypven-time to what it had been before the platelets were removed. In other words no real additive effect has been demonstrated. It is, of course, conceivable that areas of the circulation exist where platelets are filtered off in some way, and in such areas alimentary lipid might be important. But this is pure speculation. Our findings with stypven confirm the report of O'Brien (1956) and are opposed to the conclusions of Maclagan and Billimoria (1956). The latter showed, by in-vitro tests, that only a group of phospholipids found almost exclusively in milk products were important. Mutton and beef fat, egg yolk, olive oil, and cod-liver oil were inactive. This once again demonstrates the differing conclusions which can be reached by the use of in-vivo and in-vitro tests and by varying the circumstances under which the tests are done.

Recently fats containing large amounts of unsaturated fatty acids have been used to lower the serum-cholesterol. The stypven-time results mentioned above appear to be almost as applicable to fats containing small or large amounts of unsaturated fatty acids. It could thus be claimed that unsaturated fatty acids are as dangerous as regards coagulation as saturated fatty acids. In view of our negative results with all the other tests we have used, the evidence at present seems insufficient to indict either variety of fat as a cause of accelerated coagulation.

Summary and Conclusions

An attempt was made to confirm the claim that feeding mixed animal fat shortens the coagulation-time of blood, and at the same time to determine the effect of feeding fat rich in unsaturated fatty acids.

Patients were fed three types of meal—low-fat, low-fat plus salad oil, and high-fat. Coagulation-times were estimated in each series before the meal and four hours after.

The tests which were done included coagulation-time of whole blood in silicone tubes, calcium-time of plasma with varying numbers of platelets, thrombin generation test, blood-thromboplastin generation test, prothrombin consumption, and accelerated one-stage prothrombin time (stypven-time).

With the exception of the stypven-time, neither the high-fat nor the low-fat meal produced any significant change in coagulation. The oil meal (when considered without comparison with the low-fat meal) produced significant shortening of coagulation in the Lee and White test and inconsistent results with the calcium-time test. If these changes were considered together with those produced by the low-fat meal, almost all these differences fell away.

The stypven-time was significantly shorter in both the oil and high-fat series when diluted plasma was used, and in the high-fat series when undiluted plasma was used. Undiluted plasma was not significantly affected by oil.

Variables have to be considered as arising in the patient and unrelated to the fat-content of diet, during venepuncture, and during the measurement of coagulation-time. These are all very large but the first two are far more important than the third.

The measurement of the stypven-time is affected by the presence of fat in the plasma. This is true of both saturated and unsaturated fat. The importance of this in clinical medicine remains to be fully evaluated.

We have to acknowledge the large amount of assistance we have received in this study. To Prof. J. F. Brock and Prof. F. Forman, in whose department this work was carried out. To laboratory technicians Miss J. Ethelston, B.SC., Miss E. Scholtz, B.SC., Miss L. Kaplan, Miss C. Hoberman, Miss S. Tromp, Miss B. Factor, and Mr. M. Boshof for much patient work. To Dr. E. B. Dowdle and Mr. J. N. Darroch for considerable assistance with statistical analysis. To Dr. D. McKenzie for laboratory facilities. To the staff research fund of the University of Cape Town and to the South African Council for Scientific and Industrial Research for grants towards expenses. To the many patients who volunteered for the feeding experiments. To the Superintendent, Groote Schuur Hospital, for facilities.

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GLUCOSE-6-PHOSPHATASE ACTIVITY IN HUMAN DIABETES

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THE activity of glucose-6-phosphatase, which catalyses the conversion of glucose-6-phosphate to free glucose in the liver, is affected by various physiological and pathological conditions:

In certain types of glycogen-storage disease there is a deficiency of this enzyme (Cori and Cori 1952).

Fasting increases its activity in rats (Weber and Cantero 1954).

Ashmore et al (1956b) have published an extensive account of the changes in its activity as a result of fasting and of treatment with various hormones.

Langdon and Weakley (1955) demonstrated an increase in its activity in alloxan-diabetic rats.

In view of these reports the activity of this enzyme in human diabetes before and after therapy was investigated.* Hitherto little work of this type had been done on man, partly because of the necessity of using micro techniques for assaying the enzyme in liver-biopsy material.

Clinical Material

13 patients (10 males and 3 females) admitted to the University College Hospital of the West Indies with diabetes were investigated. On admission all were placed on a diet, but further treatment was withheld until numerous investigations, including liver biopsy, had been made. After stabilisation of the diabetes the investigations were repeated.

2 female patients had "J"-type diabetes (Hugh-Jones 1955)—i.e., they differed from the usual young acute diabetic mainly in that they were insulin-resistant. They were aged 17 and 21 and had been diabetic for four and five years respectively. Both were poorly controlled in spite of several hospital admissions and the outpatient administration of up to 160 and 260 units a day of insulin zinc suspension (I.Z.S.). Hospital supervision during the admission under consideration led to the stabilisation of both patients on 120 units of I.Z.S. a day while taking the type of diet that they would receive at home.

* Since the investigation was begun, reduction of glucose-6-phosphatase activity by carbutamide has been demonstrated in liver homogenates in vitro and in laboratory animals (Ashmore et al. 1956a, Hawkins et al. 1956). The dosage used, however, far exceeded the therapeutic dosage in man.

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3 patients (1 female aged 16 and 2 males aged 36 and 70) had diabetes of short duration—3 weeks, 5 months, and 5 days—and were insulin-sensitive. 2 were moderately ketotic on admission. These 3 patients could be grouped as type-I diabetes according to the classification of Bornstein and Lawrence (1951).

8 males were considered to have type-II diabetes. The type-II patient of Bornstein and Lawrence (1951)—middle-aged, obese, insulin-resistant, and not liable to ketosis—is less common in Jamaica than the non-obese middle-aged diabetic. Most of the middle-aged insulin-resistant patients admitted to hospital have never been overweight and when first seen are often well below their ideal weight (Tulloch et al. 1956). All 8 patients in this series were underweight: only 2 had ever been obese, 2 had once been of average weight, and 4 had always been below their ideal weight. Their ages ranged from 48 to 73, and the duration of their diabetic symptoms from 6 weeks to 5 years. All were treated with diet. 6 received insulin, and the daily dose at the time of their discharge ranged from 0 to 110 units of I.Z.S. 2 patients were given carbutamide by mouth. Both required large doses, 8 and 10 g. a day respectively, to achieve adequate reduction of their blood-sugar levels and, after the liver biopsy and other investigations had been repeated, both were transferred to treatment with I.Z.S. before their discharge

7 non-diabetic patients submitted to liver biopsy for other reasons were also investigated.

Biochemical Methods

The liver biopsies were made in each case at about 9 A.M. while the patients were still fasting. A Vim Silverman needle was used.

The excised liver tissue was immediately placed in a small tube and frozen in solid carbon dioxide. Experiments with rat liver had shown that this treatment had no significant effect on the enzyme activity (Patrick 1956). The method used for assay of the enzyme was a micro-modification of that described by Langdon and Weakley (1955):

TABLE I—GLUCOSE-6-PHOSPHATASE ACTIVITY IN LIVER OF DIABETICS

Case no.	Type of diabetes	Therapy	Glucose-6-phosphatase activity (units)*	
			Before therapy	After therapy
1	I	Insulin	0·397	0·141
2	I	Insulin	0·316	0·157
3	I	Insulin	0·286	0·191
4	J	Insulin	0·295	0·200
5	J	Insulin	0·221	0·157
6	II	Insulin	0·355	0·183
7	II	Insulin	0·175	0·146
8	II	Insulin	0·209	0·159
9	II	Insulin	0·354	0·214
10	II	Insulin	0·252	0·208
11	II	Insulin	0·201	0·172
12	II	Carbutamide	0·235	0·175
13	II	Carbutamide	0·233	0·178

* 1 unit of glucose-6-phosphatase is equivalent to 1 micromole of inorganic phosphate liberated per mg. of liver nitrogen a minute.

3–5 mg. of the biopsy material was quickly weighed on a micro balance with a sensitivity of ±0·02 mg. The liver was then homogenised in 120 µl. of citrate-buffer solution at pH 6·5. Several experiments had indicated that pH 6·5 is at or near the optimal pH for glucose-6-phosphatase activity as it occurs in the human liver. Duplicate 20-µl. amounts of the homogenate were removed for determination of nitrogen content, and duplicate 10-µl. amounts of the homogenate were used for the enzyme assay. The reagents were measured with micropipettes of the types described by Bessey et al. (1946).

The final concentrations of the reagents in the enzyme assay were:

Liver	1–2%
Glucose-6-phosphate	0·02*M*
Citrate buffer pH 6·5	0·09*M*

The enzyme tubes were incubated for 30 minutes at 37°C, and the reaction was terminated by the addition of an equal volume of 10% trichloracetic acid.

Inorganic phosphate was determined by a micro-modification of the method of Taussky and Shorr (1953) which uses ammonium molybdate, ferrous ammonium sulphate as reducing agent, and a Beckman spectrophotometer fitted with the micro attachment described by Lowry et al. (1945).

The amount of nitrogen in the homogenate was determined by Kjeldahl digestion followed by ammonia determination using micro-Conway units as described by Kirk (1950).

Results

The results are expressed as micromoles of inorganic phosphate liberated each minute per mg. of liver nitrogen. Experiments with rat and human liver tissue had shown that the liberation of inorganic phosphate was proportional (within the limits of experimental error) to the concentration of enzyme and to time.

Table I summarises the results obtained in the 13 diabetics. The average enzyme activity in the whole group was 0·271 units before therapy and 0·175 units after therapy, whereas in 7 non-diabetic patients it was 0·155 units. Results obtained for enzymic activity

TABLE II—GLUCOSE-6-PHOSPHATASE ACTIVITY IN BIOPSY SPECIMENS FROM DIFFERENT LOBES OF LIVER OF RATS ON NORMAL DIET

Rat no.	Glucose-6-phosphatase activity (units)*	
	Left lateral lobe	Median lobe
1	0·200	0·202
2	0·215	0·228
3	0·190	0·214
4	0·216	0·228
5	0·224	0·227
6	0·292	0·307
7	0·341	0·323
8	0·370	0·370
Mean	0·256	0·262

* Units as in table I.

of duplicate amounts of the same homogenate showed consistent agreement to within ±1%. It was impossible to compare enzyme activities in duplicate biopsy specimens obtained from different sites in the same human liver, but this was done in rat's liver, and it was found that the results were in agreement to within ±5% (table II).

Summary

There is increased activity of glucose-6-phosphatase in the liver of diabetics compared with non-diabetics.

Stabilisation of the diabetes was followed by decreased activity of the enzyme in 13 patients, whether the diabetes was type I, II, or J, and whether insulin or carbutamide had been administered.

We are indebted to Dr. R. A. Irvine for the liver biopsies.

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PANCREATIC NECROSIS IN CORTISONE-TREATED CHILDREN

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NECROSIS of the pancreas and of peripancreatic fat tissue occurs only very rarely in childhood. In the present two cases it was probably the result of cortisone therapy.

Case-reports

Case 1.—A girl, aged 11 years, was admitted to the Children's Hospital, Birmingham, on May 24, 1955, under the care of Dr. J. W. Gerrard. From the age of 1 year she had had frequent severe attacks of asthma, which a course of cortisone, started in January, 1955, much improved. Early in May, 1955, she came from Eire to Birmingham, and within a few days her supply of cortisone ran out. During the next fortnight the attacks of asthma recurred, and on admission she was in a severe attack, cyanosed, wheezing, and dyspnœic.

Treatment and Progress

This attack responded to aminophylline and ephedrine, but she had further attacks during the next few days. Despite repeated injections of adrenaline and aminophylline and a course of aureomycin (chlortetracycline) the attacks became more severe. On June 1 it was decided to start cortisone again, and at 3 P.M. she was given the first dose (25 mg. by mouth). For the next five hours she appeared well, but at 8.30 P.M. she suddenly became deeply cyanosed and dyspnœic and died within five minutes. This final episode differed from her attacks of asthma in that there was only very slight wheezing.

Necropsy

A normally developed, well-nourished girl with slight clubbing of fingers and toes, a pigeon-chest deformity, and slight pitting œdema of feet and legs.

The *lungs* were extremely emphysematous, particularly the upper lobes, and thick yellowish exudate was present in the small bronchi. The tracheobronchial lymph-nodes were swollen, dark-red, and soft. The *heart* (187 g.) showed eccentric hypertrophy of the right ventricle. The *liver* (990 g.) was congested. The *pancreas* was dark-red, with darker blackish-red spots, and extremely soft. On the cut surfaces no lobular structure was discernible. The spleen (95 g.) was soft, with diffluent pulp. The *suprarenal glands* were thin, the right depleted of lipids. One *parathyroid gland* was enlarged (8 mm. in longest diameter).

Histology

The *lungs* showed congestion and œdema; there was a very occasional small monocytic peribronchial infiltrate, but eosinophils were absent. Some alveoli were lined by a pale eosinophil hyaline membrane. The *liver* showed mild acute congestion. The *kidneys* were congested, showing occasional cortical cysts (150 μ in diameter) and cloudy swelling of the proximal convoluted tubules.

One *suprarenal* was 3 mm. thick. The zona glomerulosa showed œdema of interstitium; the zona fasciculata and zona reticularis were almost completely replaced by irregularly arranged spherical and polyhedric cells with a vesicular nucleus and an abundant cytoplasm filled partly with pale eosinophil granules, partly with vacuoles. This zone resembled more the transient cortex or the hyperplastic cortex of adrenogenital syndrome than a normal permanent cortex. The medulla was well developed and appeared normal. The other suprarenal was 1·25 mm. thick, with similar structure.

Pancreas.—Extensive areas of pancreatic tissue showed necrosis and necrobiosis. In the most severely affected areas the secretory cells were anuclear, shrunk, pale, basophilic, and recognisable only by their outlines against distended capillaries, which were filled with clumped masses of red blood-cells (fig. 1). In other areas the cells were dissociated, without acinar arrangement, and they were shrunk, their cytoplasm

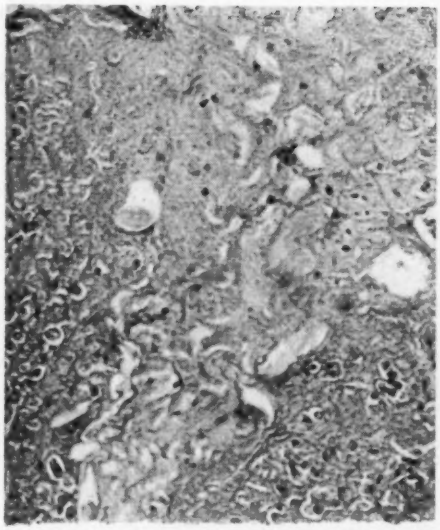

Fig. 1—Case 1 : pancreas. (Hæmatoxylin and eosin. ×150.)

homogenised and eosinophilic, and their nuclei pyknotic. The necrotic and necrobiotic process affected equally the secretory tissue, the islets of Langerhans, and the vascular system. The walls of arteries and arterioles were hyalinised or necrotic, and hæmorrhages were seen around necrotic arteries. Where the necrosis affected the periphery of a lobule, the whole interlobular tissue appeared as an anuclear mass of eosinophilic fibres and altered red blood-cells, with many clefts and pseudocystic spaces ; only the nerve bundles appeared resistant to the necrotising process. Hæmosiderotic pigment was absent. All intrapancreatic and immediate peripancreatic fat tissue was necrotic (fig. 2).

One *parathyroid* measured 4·00 × 1·75 mm. ; another had a diameter of 1·2 mm. ; their structure was normal. There were a few follicular cysts in the *ovaries*, and occasional cytomegalic inclusions in the *parotid gland*. The *pituitary* was unfortunately lost.

Case 2.—A boy was first seen by one of us (O. H. W.) in October, 1955, when he was aged 2 years and 10 months. He had developed normally until a month previously, when his parents noticed that his legs were becoming weak : he also had severe constipation. No definitely abnormal signs were discovered, but during the next three weeks the weakness increased so rapidly that he could not sit or stand without support ; his voice became nasal, and food regurgitated down his nose. On Nov. 3, 1955, he was admitted to the Children's Hospital, Birmingham.

Examination

There was now definite weakness of all muscles of his limbs, trunk, face, and palate. The tendon-reflexes were present but diminished, the plantar reflexes being flexor. Sensation was unimpaired. The skin was normal. The cerebrospinal fluid was normal. White-cells in the blood numbered 14,500 per c.mm. (polymorphs 62%). Urinary excretion of creatine was high, with a creatine coefficient of 12·6 (normal for age 7·9). Radiographs of skull, abdomen, and chest, examination of urine for porphyrins, and electro-encephalography gave normal results.

Treatment and Progress

During the next fortnight the weakness progressed rapidly : the limb muscles became abnormally firm and passive movements of knees and hips became restricted. He developed great difficulty in swallowing and had to be tube-fed ; simultaneously his respiratory muscles became weaker, and he showed cyanosis. At this stage a diagnosis of polymyositis was made and on Nov. 17 treatment with cortisone 25 mg. thrice daily was started. During the next few days the improvement in respiration and swallowing was dramatic, but on Nov. 28 signs of congestive heart-failure appeared. The electrocardiogram was normal. Treatment with digoxin, mersalyl, salt-free diet, and penicillin relieved the heart-failure. From Dec. 12 prednisolone (5 mg. four times daily) was given instead of cortisone.

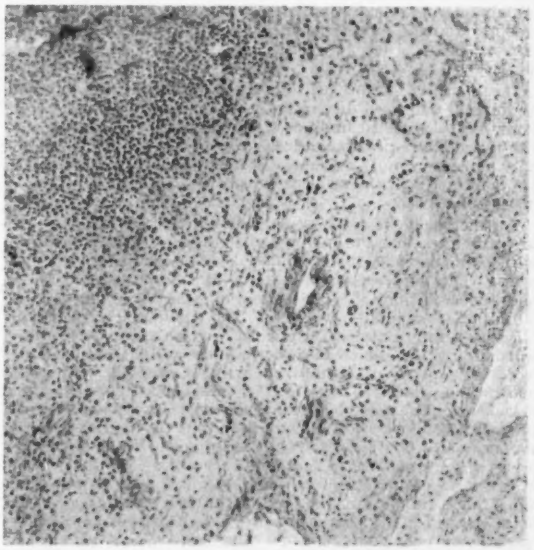

Fig. 3—Case 2 : pancreatic necrosis with cellular infiltration and deposits of calcium. (Van Gieson and elastic-tissue stains. ×80.)

The initial spectacular improvement with corticoids was not maintained ; despite physiotherapy fibrous contractures of hips and knees and an equinus deformity of the ankles developed. Repeated severe infections of the respiratory tract necessitated several courses of antibiotics, and in March, 1956, he developed thrush stomatitis. At this stage skin changes were first noted : areas of brown pigmentation on the extensor aspects of the forearms ; reddening of the skin on the cheeks ; over the back and the dorsum of the feet the skin was shiny and tightly stretched ; and several areas of alopecia developed. There was much skin irritation. A firm diagnosis of dermatomyositis was now made and on March 19 he was discharged home, where he continued to receive prednisolone (5 mg. thrice daily). During the next five months his condition remained almost stationary.

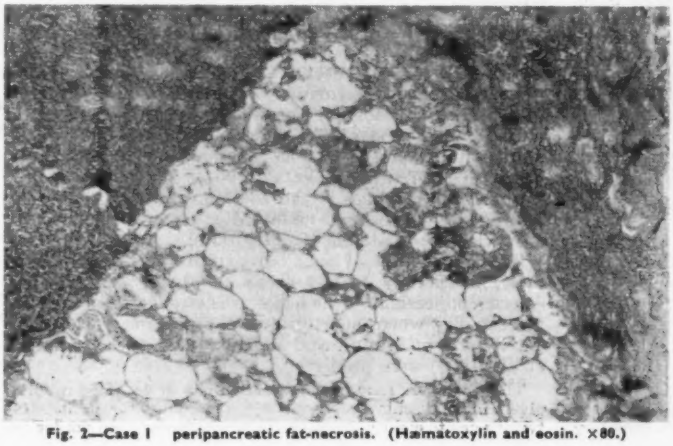

Fig. 2—Case 1 peripancreatic fat-necrosis. (Hæmatoxylin and eosin. ×80.)

Readmission

On Aug. 13 he was readmitted. For twenty-four hours he had had abdominal pain and vomiting. His condition was very poor; temperature 102°F. His abdomen was distended, and a round mass was palpable in the midline below the costal margin; it extended about four finger-breadths below the xiphoid process. The white-cell count was 20,000 per c.mm. (polymorphs 74%). Radiography of the chest showed a small area of consolidation in the posterior basal segment of the left lower lobe. After screening, Dr. R. Astley reported: "Normal movements of the diaphragm. The upper abdominal mass shows a rounded lower border on the right. Its margin appears to run into that of the liver. There is no indication of its nature." A blood-culture was sterile. The vomitus contained altered blood. The urine contained sugar during the first twenty-four hours after admission. His bad condition contra-indicated laparotomy. The pneumonia was treated with tetracycline; but the pyrexia continued. Ten days later the dose of prednisolone was increased to 5 mg. four times daily. Within forty-eight hours the pyrexia abated, the abdomen became less distended, and the mass decreased and became impalpable. Radiography of the chest on Aug. 28 showed resolution of the consolidation. The boy was discharged home on Aug. 30.

Further Readmission

On Sept. 15, 1956, he was again admitted, having had abdominal pain and distension and vomiting for twenty-four hours. The physical findings were essentially the same as at the time of the previous admission. Within a few hours he had another vomit, became deeply cyanosed, and died six hours after the last dose of prednisolone.

Necropsy

An extremely wasted boy, normal in height for his age, with hips and knees fixed in half-flexed position. The *skin* was thin with pale brownish macules on the extensor surface of both arms. The *lungs* were congested; the *heart* weighed 83 g. and appeared normal. The *abdominal cavity* contained about 20 ml. of clear pale-brown fluid. The whole epigastrium was filled by a firm mass partly yellowish-white and partly white, surrounding the pancreas and the spleen. After separation from the liver a plum-sized cavity was exposed within the mass which was filled with diffluent material. The mass was attached to the stomach, but nowhere was there a communication with the lumen of the stomach, and the gastric mucosa was normal. The *pancreas* was embedded in the main mass, it was in some parts hard, in others very soft; the cut surfaces, in which no lobular structure was discernible, had a variegated appearance, with pink, red, yellowish, and white areas. The *liver* weighed 870 g. and showed severe fatty changes. The *spleen* was enlarged (70 g.). The left *adrenal gland* was extremely atrophic, discernible as a thin leaf within pale-yellow hard fat tissue. On the right side a firm pale yellowish-white pad was seen which had the shape of the adrenal but within which only fat tissue was discernible. There was œdema of the *brain*.

Histology

The *liver* showed severe fatty changes and abundant glycogen granules in the liver cells, round-cell infiltration, and some fibroblastic proliferation in the periportal spaces. In the *spleen* the red pulp was studded with numerous nests which consisted of 6–20 spherical or ovoid cells 14–26 μ in diameter. The morphology of these cells, their staining properties, and histochemical reactions corresponded to Gaucher's disease, but in no other organ apart from the spleen were such cells seen. (Their chemical analysis and histochemical study will be reported later.)

Kidneys.—Most of the parenchyma showed no significant changes but there were a few small foci consisting of hyaline casts in grossly distended tubules, calcium deposits, occasional hyalinisation of a glomerulus, with very occasional calcification, thickening of capillary basement membrane, and interstitial fibrosis.

The left *suprarenal gland* was 1·0–1·5 mm. thick; its structure was normal. There was extensive necrosis of the peri-adrenal fat tissue. The *right suprarenal* showed nothing abnormal apart from atrophy. No necrosis of surrounding fat.

Pancreas.—The pancreatic tissue was reduced to a few small irregular lobules in which secretory cells were intact and contained zymogen granules. Most of it was replaced by necrotic, fibrillary, or granular faintly eosinophilic masses, patches of polymorphs, nuclear debris, and granular calcium deposits (fig. 3). Here the islets of Langerhans were affected by the necrotising process to the same extent as the secretory

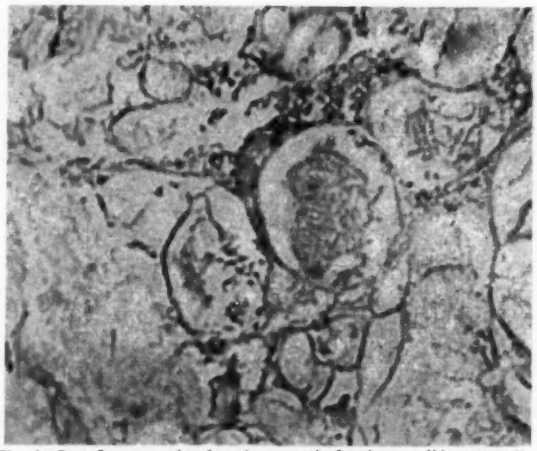

Fig. 4—Case 2: necrosis of peripancreatic fat-tissue. (Hæmatoxylin and eosin. ×80.)

tissue. Capillaries were not seen in the necrotic areas, and arterioles were often recognisable only by wavy rings of elastic tissue. Intact red blood-cells were not seen. Hæmosiderin was scanty in the form of widely scattered extracellular granules. Often the necrosis involved the whole arterial wall, including the elastic membrane. In none of the recognisable arteries was fibrinoid demonstrable. Occasionally a thrombus in organisation was seen in a not completely necrotic artery. Sudanophil material was scanty; it was seen in patchy distribution in the form of extracellular drops. In such areas a few anisotropic crystals with "Maltese crosses" were also seen.

Peripancreatic fat tissue.—All the fat cells were necrotic and replaced by irregularly outlined masses of pale eosinophilic anuclear material (fig. 4). The fatty lump adherent to the left abdominal wall consisted of lobules of necrotic fat tissue with calcification, surrounded by a fibrous capsule and granulation tissue which was poor in capillaries. An occasional patch of a mucoid (periodic-acid Schiff positive) substance was seen within the necrotic fat tissue. Cell membranes separating two or more cells were often ruptured or had disappeared, forming micro-fat cysts.

Pituitary.—The number of basophil cells appeared to be increased, but sections from only one level were examined. These cells stained blue with azan and appeared to correspond to delta-cells (Purves 1956). Some of these cells were hypertrophic and/or showed hyalinisation of the cytoplasm. Such changes were best seen with the stain of Róna and Morvay (1956), and degranulation was evident in the performic acid-aldehyde fuchsin stain of Russell (1956) when compared with normal controls.

Muscles and skin.—Further histological findings, illustrative of the effect of cortisone in dermatomyositis, will be published separately.

Discussion

Pancreatic necrosis—often called acute hæmorrhagic pancreatitis—is extremely rare in childhood. Gibson and Gibson (1956) collected 27 published cases of severe "hæmorrhagic pancreatitis" in childhood and added 1 of their own. Most of these cases were secondary to mumps, scarlet fever, diphtheria, typhoid fever, influenza, otitis media, or trauma (Shallow and Wagner 1947, Végelhyi 1947, Shanks et al. 1954), and the so-called primary form, which is the common form in the adult and is often associated with gall-stones, was seen only exceptionally in a child (Dobbs 1935).

The association of such an exceptional disease with corticoid therapy on two occasions already suggested a causal connection. This belief was strengthened almost to certainty when, shortly after the necropsy of case 1, the reports of Stumpf and Wilens (1955) and of Stumpf et al. (1956) were published.

These workers found pancreatic lesions in 44 of 53 rabbits given intramuscular cortisone 3–8 mg. daily for periods of twenty-one to eighty-one days. They emphasised the similarity

to early autolysis. The earliest observed changes consisted of reduced basophilia of the basal portion of acinar cells. This was followed by vacuolisation, shrinkage, disarrangement of acinar cells, and necrosis, with accumulation of polymorphs. Peripancreatic fat-necrosis was present in 13 of 44 cortisone-treated rabbits with pancreatic lesions. Pancreatic changes in cortisone-treated rabbits have been described by Lazarus and Bencosme (1955, 1956), who consider them to be proliferating intercalated ducts, but Stumpf et al. interpret them as proliferation of duct-like cells within remnants of destroyed acini.

If we compare the descriptions of experimental pancreatic necrosis produced by administration of cortisone with the findings in our two cases, it becomes clear that they differ only in severity, our cases being instances of acute and subacute diffuse hæmorrhagic necrosis of the pancreas associated with peripancreatic fat-necrosis.

In view of the wide use of cortisone therapy in a variety of diseases, and particularly the reports on beneficial effects of cortisone in "acute hæmorrhagic pancreatitis" (Brockis and Jones 1956), one is forced to assume the existence of a peculiar constitutional disposition, but its nature is obscure. Although a link between our two cases is suggested by the reported association of asthma with diffuse collagen-disease (Gillespie and Poteliakhoff 1951), hypersensitivity per se cannot be responsible, because allergic patients represent a considerable proportion of those treated with cortisone and no instance of association with pancreatic necrosis in man has yet been reported. (One of us [H. S. B.] tried to produce cortisone hypersensitivity in guineapigs but with no success.) In addition, only in case 1 had there been a break in cortisone treatment, with a fulminating illness when the therapy was started again; in case 2 the therapy was continuous. No indication of the nature of the disposition can be found in case 1, but in case 2 the association with an isolated lipidosis of the spleen may possibly indicate the presence of an inborn metabolic error.

Similarly the mechanism of cortisone-induced pancreatic necrosis can only be a matter of speculation. The "reflux" mechanism described by Opie (1901) is usually considered to be the main factor in the development of pancreatic necrosis. Closely related is the mechanism of stagnating secretion resulting from squamous metaplasia of duct epithelium, which Rich and Duff (1936) believe to be the principal cause. Block et al. (1954) produced necrosis of pancreatic tissue and peripancreatic fat-necrosis when obstruction of pancreatic ducts was combined with experimental ischæmia of the organ. Thal and Brackney (1954) produced fulminating pancreatic necrosis in rabbits and goats as a local Shwartzman phenomenon when they injected endotoxins of meningococci or *Escherichia coli* into the pancreatic duct and subsequently the same endotoxin by the intravenous route. Rapid diffusion of the toxin from the duct after preparatory injection led apparently to sensitisation of vascular endothelium. It is not likely, however, that this mechanism operated in our two cases. There was no evidence of recent infection in case 1; and, although in case 2 an abdominal mass and pneumonia were diagnosed simultaneously, the size of the mass suggested that the pancreatic disease was present already before the development of the febrile illness. Equally, mechanical obstruction and epithelial metaplasia can be excluded on the basis of the necropsy findings. Dietary imbalance, which is known to produce "pancreatitis," was not present.

A direct toxic action exerted on the secretory tissue of the pancreas is possibly responsible for "pancreatitis" due to ethionine, carbon tetrachloride, and other compounds, but is not probable with corticoids. We believe that cortisone has an effect on pancreatic secretion and that, in the presence of an unknown constitutional disposition, this causes stagnation of the secretion and pancreatic necrosis by a "reflux" mechanism.

The renal changes observed in case 2 were probably related to the pancreatic necrosis. They were almost identical with those described by Lynch (1954) in 4 cases of "acute hæmorrhagic pancreatitis." Unfortunately only paraffin-embedded kidney tissue was examined and therefore nothing can be said about the presence or absence of fat-emboli.

Both cases showed atrophy of the adrenal glands, particularly case 2, in which atrophy was associated with replacement lipomatosis. The structure of the adrenal cortex was in this case normal, but the milder atrophy in case 1 was associated with gross alteration of the architecture and cellular morphology. This atrophy can be attributed to the corticoid therapy. From our rather limited experience with leukæmic children it appears that severe atrophy may be commoner with prednisolone. The pituitary in case 2 showed changes similar to those described by Thornton (1956) in cortisone-treated patients.

Summary

In 2 children pancreatic necrosis followed corticoid therapy for asthma and dermatomyositis respectively. The pancreatic necrosis was apparently caused by the corticoid therapy.

We wish to thank Prof. J. W. Gerrard for the clinical notes of case 1; Mr. A. R. Detheridge for technical assistance; and Mr. J. G. Williamson for the photographs.

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PANCREATIC NECROSIS IN A CASE OF STILL'S DISEASE

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EXCEPT in mumps, acute disease of the pancreas is rare during childhood. Dobbs (1935) collected 14 cases and added 1 of his own. Jaeger (1943) summarised 10 more, including 1 that he had seen. 4 further cases have since been reported (Shallow and Wagner 1947, Shanks et al. 1954, Gibson and Gibson 1956, Pender 1957).

Case-record

A boy aged 5 years was admitted to our clinic in August, 1955, with pain in his joints. He had been well until the previous June, when he had fever with enlargement of lymph-glands. A month later there was pain and swelling of ankle, knee, elbow, and wrist joints.

Examination

On admission, his temperature was 37·8°C, and he had pain in the legs, hands, wrists, and elbows. The skin and mucous membranes were pale yellow and many lymph-glands were

enlarged. The spleen was felt at the costal margin, and the liver three finger-breadths below the ribs. The knees were swollen, spindle-shaped, and slightly contracted, and the ankles also spindle-shaped and swollen.

The erythrocyte-sedimentation rate (Westergren) was 120 mm. in one hour and 150 mm. in two. The red-cell count was 2,990,000 per c.mm. The albumin/globulin ratio was reversed. Radiography of the affected joints showed only slight decalcification. The diagnosis of Still's disease was established.

Treatment

Treatment started with corticotrophin (A.C.T.H.) in large doses (10 mg. six-hourly) because the disease was acute, and a low-salt diet. After two weeks, the child was much better, but lowering the dosage of corticotrophin led to deterioration.

Two months after admission, the dose of corticotrophin was increased again to 40 mg. daily, but the joint pains in the lower limbs increased. Improvement followed intravenous infusion of corticotrophin in a 5% solution of glucose, beginning with 40 mg. daily and diminishing gradually to 25 mg. Later, intramuscular injections were resumed: the dosage was 40 mg. daily at first but was then adjusted to the boy's state.

Final Illness

At the end of the fourth month he had a left-sided pneumonia. The temperature rose to 40°C, and the joint symptoms increased. This was followed by an attack of smallpox, during which the corticotrophin was stopped for four days. On the day before his death (six days after developing smallpox), his general condition was rather good and his temperature normal, but in the evening he began to complain of acute abdominal pain, and his abdomen became swollen, with rebound tenderness but no muscle resistance. Next day the temperature rose to 39·8°C, he became very restless, and generalised convulsions preceded death.

Post-mortem Findings

Necropsy showed fat necrosis of the pancreas and greater omentum, and a subcapsular hæmorrhage in the tail of the pancreas. Histologically, the pancreatic lobules were well conserved; the interlobular connective tissue contained mostly lymphocytes, but in some parts leucocytes and hæmorrhage; and necrosis of fat tissue was widespread.

Comment

Pancreatic necrosis has been reported in association with lesions of the neighbouring organs (Connell 1941, Herfort 1951), acute infections (Dozzi 1946), and intoxications. In childhood mumps and otitis are the commonest causes (Adams 1939). In our case the pancreatic necrosis may have been caused by Still's disease (which could produce obliterative changes in the pancreatic vessels leading to necrotic changes), by the pneumonia or smallpox, or possibly by the corticotrophin the child had been receiving.

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"One of the reasons why popular discussions on psychological matters are so uninformed is perhaps the fact that psychology, being a science, uses methods and discussions of a highly technical nature. In particular, it uses statistical methods, and most people have developed a strong avoidance reaction to statistics. This reaction is both interesting and odd because it seems to be rather one-sided. A discussion of odds in horse-racing, or permutations and combinations in football pools, is no less statistical for being popular and widespread, yet when the psychologist attempts to employ statistical methods in relation to serious subjects he encounters the usual obscurantist notion that you can prove anything with statistics. In a sense, this is true. You can 'prove' anything with statistics, but only to a person who is completely ignorant of elementary statistical notions."—H. J. EYSENCK, *Sense and Nonsense in Psychology*. Harmondsworth, 1957; p. 17.

SARCOSPORES AND TOXOPLASM SEROLOGY

AN INVESTIGATION OF THEIR ALLEGED CROSS-REACTION

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EXPERIMENTAL evidence (Cathie 1957) contradicting various attacks on the specificity of the dye test and the complement-fixation test for toxoplasmosis seems to show that complement-fixing antigens made from animal tissues give non-specific results, that much of the experimental work done on animals was not applicable to man, and that a substance contained in some sheep and other animal sera and capable of modifying toxoplasms was not the dye-test antibody because it was heat-labile. This observation led to the recommendation that sera to be used in the dye test should be previously inactivated to avoid misleading results due to this toxoplasm-hostile factor.

The Sabin and Feldman (1948) dye test for toxoplasmosis consists in showing that an antibody can modify normal toxoplasms so that, on the addition of methylene-blue, they do not stain. For this interaction a heat-labile substance, known as accessory factor, present in normal human serum is essential.

Awad (1954) claimed that sarcospores of *Sarcocystis tenella* could be used interchangeably with toxoplasms in the dye test. He found that all of 6 sheep and each of 2 rabbits infected with sarcocystis gave a positive dye test with sarcospores; all of 3 guineapigs infected with toxoplasms gave a positive dye test with sarcospores; and 3 human, 3 sheep, and 2 rabbit "control" sera were negative. He found further that human sera giving a positive dye test for toxoplasmosis gave the same reaction to similar titres when sarcospores were used instead of toxoplasms.

The many technical considerations involved in setting up a dye test with sarcospores are not dealt with by Awad. The bugbear of all dye tests, both in this country and abroad (J. K. Frenkel, personal communication), is the necessity for adequate supplies of antibody-negative suspending serum, and the provision of this in a form suitable for using sarcospores was not discussed by Awad.

We report here an attempt to repeat Awad's work.

Material and Methods

Sarcospores were obtained by the kind coöperation of Mr. H. T. Yelland, of the Islington Cattle Market, who provided us with fresh sheep gullets containing visible parasitic lesions. Suspensions of sarcospores were prepared from these by the method described by Awad (1954). Since Awad did not indicate to what age sarcospores could be used, tests were made with them as soon as a suspension had been prepared from fresh gullets and up to a month later.

Sarcocystis complement-fixing antigen was kindly supplied by Prof. P. C. C. Garnham.

Suspending serum known to be free from toxoplasm dye-test antibody was obtained from the same donor who has supplied us with serum for routine dye tests for the past seven years. Dye-test techniques were those described by Cathie and Dudgeon (1953) and Cathie and Cecil (1954).

Human sera containing different antibody content for toxoplasms were chosen from those sent by other laboratories for routine testing.

Results

Dye tests with 23 human sera of known toxoplasm-antibody content were set up with toxoplasms and sarcospores, the sarcospores being used on the day of receipt or as fresh as possible. About a third of the sera contained toxoplasm antibody, but all 23 gave a positive dye test with the sarcospores (table I). 93 other human sera were

TABLE I—RESULTS OF TESTS WITH HUMAN SERA

Human sera nos.	Results			
	Toxoplasm dye test with suspending serum in dilution			Sarcocystis dye test with no suspending serum in dilution 1/4
	1/4	1/8	1/16	
1	−	−	−	+
2–7	−	−	−	+
8	+	+	+	+
9	−	−	−	+
10–11	+	+	+	+
12	−	−	−	+
13–14	+	+	−	+
15	+	+	+	+
16–18	−	−	−	+
19–20	+	+	−	+
21–23	−	−	−	+

therefore investigated as they came to hand, and all were found to have antibodies which modified the sarcospores used in this test.

On repeating the test with sarcospores and the same 23 human sera after inactivation at 56°C for 30 minutes, all the tests had become negative, the sarcospores not being modified but staining readily with methylene-blue.

Awad (1954) said he suspended the sarcospores in either saline solution or "normal human serum," and his dilutions were made in "normal human serum." All the 116 normal human sera that we have tested contained sarcospore-hostile substances which render the dye test impossible. In table I, where human sera were put up with sarcospores, the sera provided their own accessory factor if such were necessary. When these sera gave no modification after inactivation, it may have been either because the sarcospore-hostile factor had been removed or because accessory factor had been destroyed; but, since all the sera not inactivated contained this sarcospore-hostile factor, it was impossible to add a secondary source of accessory factor to show precisely what factor, or factors, had been inactivated.

TABLE II—RESULTS OF TESTS WITH GUINEAPIG SERA

Guineapig serum immunised with sarcocystis C.F.T. antigen	Results of dye test made with sarcospores and toxoplasmosis-negative suspending serum in dilution							
	1/4	1/8	1/16	1/32	1/64	1/128	1/256	1/512
1, Guineapig serum unheated, all diluents saline	+	+	+	+	+	+	−	−
2, Guineapig serum unheated, suspending serum unheated ..	+	+	+	+	+	+	+	+
3, Guineapig serum unheated, suspending serum heated	+	+	+	+	+	+	−	−
4, Guineapig serum heated, all diluents saline	+	−	−	−	−	−	−	−
5, Guineapig serum heated, suspending serum unheated ..	+	+	+	+	+	+	+	+
6, Guineapig serum heated, suspending serum heated	+	−	−	−	−	−	−	−

Sera which contained dye-test antibody for toxoplasms and, after inactivation, did not modify sarcospores any longer were shown to have their dye-test antibody for toxoplasms still complete, thus showing the essential difference between this antibody and whatever in the non-inactivated state can modify sarcospores.

Any attempt to remove this sarcospore-hostile factor differentially by inactivation would defeat its own ends because, unfortunately, accessory factor is heat-labile, and a dye test cannot be made if all the sera taking part in the test have been inactivated.

Table II illustrates experiments which confirm this point. In experiment 1 a guineapig was immunised with sarcocystis complement-fixing antigen, and its complement-fixation test became positive. A false dye test with sarcospores on this guineapig's serum was positive at a dilution of 1 : 128 but negative at 1 : 256; this must have been a false test because the doubling dilutions were made in saline solution, and at a dilution of 1 : 256 there cannot possibly have been enough accessory factor present for this to be a true dye test (we have to make all our dilutions in normal human sera to make the toxoplasm dye test work satisfactorily). The same guineapig serum, put up as a formal dye test using our toxoplasm accessory-factor serum was positive at all dilutions, showing once again that "normal human serum" cannot be used for a dye test with sarcospores.

The guineapig serum after inactivation at 56°C for 30 minutes fell in titre with sarcospores in saline solution from 1 : 128 to 1 : 4. If this fall was due to the destruction of accessory factor in the guineapig serum, the test should have become negative. The result is far more likely to be due to the destruction of most of some sarcospore-hostile factor. That a similar factor is present in the donor of our accessory-factor serum for toxoplasmosis is shown by experiment 3 in table II, in which the guineapig's titre was still 1 : 128 when our suspending serum after inactivation was used for the diluent. Experiments 5 and 6 of table II confirm that our normal human suspending serum cannot be used for a dye test with sarcospores.

Age of Sarcospores

As we had no information about the age to which a sarcospore suspension can be used, the experiment was repeated which showed that inactivated sera had lost the ability to modify fresh sarcospores. The sarcospores, on the second occasion being 30 days old, were still all modified by human sera. On this occasion, however, inactivation did not affect the sarcospore-hostile factor, all of 22 sera modifying the sarcospores after heating in the same way as they all had done before heating.

The meaning of this finding is not clear. As far as can be seen, the only variable factor is the age of the sarcospore suspension; the sarcospores, at the age of 30 days, had altered so that they became modified with inactivated sera, a property they did not have when fresh. We had thought, on possibly slender grounds, that the dye test with toxoplasms was a vital phenomenon; but it does not seem likely that this alteration in the capacity of sarcospores, after 30 days in the refrigerator, for being modified by human sera can be connected with any vital capacity of the sarcospores, particularly as, when fresh, they do not have this property of modification by inactivated sera.

Sheep Sera and Sarcosporidiosis

Of 10 sheep sera collected at random from the abattoir 6 contained complement-fixing antibodies for sarcosporidiosis and 4 did not. All the sera gave an apparent

dye test with sarcospores in that the sera modified them, but after inactivation these 10 sheep sera no longer modified fresh sarcospores. This result indicates that sheep sera contain a heat-labile substance similar to that in human sera capable of modifying sarcospores; but this substance shows no conformity with the complement-fixing antibody; and, if the latter can be taken to indicate infection with sarcocystis, the sarcospore-hostile factor, giving an apparent dye test in 100% of all the sera that we have tested, does not appear to diagnose anything.

Comment

We feel that Awad's (1954) claim that sarcospores can be used interchangeably for the diagnosis of both toxoplasmosis and sarcosporidiosis is refuted, because all of 116 human sera and all of 10 sheep sera contained a sarcospore-hostile factor. That this can be removed by inactivation at 56°C for 30 minutes would not help in establishing a dye test with sarcospores, because accessory factor would inevitably be concurrently removed, and without this the dye test cannot be made. Also, the dye-test antibody for toxoplasmosis is heat-stable. Secondly, we have encountered this perplexing finding that fresh sarcospores are not modified by inactivated sera, whereas old sarcospores are; unless and until this phenomenon can be explained rationally and perhaps exploited, there seems to be no point in further concern with sarcospores in the laboratory diagnosis of toxoplasmosis. Even if this were to be worked out, there is still our total inability to find either a negative control or, indeed, a negative test.

On repeating Awad's (1954) work we were unable to obtain results at all comparable with his. Our technique of the dye test does not differ materially from that originally described by Sabin and Feldman (1948) and used by Awad and has given us consistent results over eight years. The only difference between the two dye-test techniques used in our experiments was the substitution of sarcospores for toxoplasms. Although we have meticulously followed such technical details as are mentioned by Awad, we have not found it possible to use sarcospores in the diagnosis of anything, and it seems probable that Awad did not mention some point of technical detail our omission of which has led to these discordant results.

The suggestion that there is some common antigenic relationship between sarcocystis and toxoplasms is not upheld by our findings; in fact, the ability to remove the sarcospore-hostile factor and to retain the toxoplasm dye-test antibody, together with the apparent specificity of the toxoplasm dye-test antibody for toxoplasmosis, indicates that these are two different substances. It is a pity that we could not make this test work, because, as Awad points out, sarcospores are much bigger and more readily visible than toxoplasms, and if we had been able to use them we would gladly have substituted sarcospores for toxoplasms in the dye test for toxoplasmosis.

Summary

Evidence is presented that human and sheep sera contain a substance capable of modifying the spores of *Sarcocystis tenella* so that they do not stain with methylene-blue.

This substance was present in all of 116 human and all of 10 sheep sera.

Sarcospores therefore cannot be used to demonstrate the presence of dye-test antibodies for toxoplasmosis or sarcosporidiosis.

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RESULTS OF RADIOTHERAPY IN OSTEO-ARTHRITIS OF THE HIP

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OSTEO-ARTHRITIS has been treated by radiotherapy for over fifty years, but its mode of action and value are by no means agreed (Tillis 1944).

Langer (1933) attributed relief of pain to the effect of radiation on non-myelinated nerve-endings, with consequent hyperæmia and improved metabolism.

Hill (1952) supposed that diminished sensitivity of nerve-endings contributed, with hyperæmia, to the relief of pain.

On the other hand, Kaplan (1945) thought that the blood-supply was reduced and that diminished inflammatory response relieved pain by reducing distension of nerve-sheaths.

Harrison et al. (1953) confirmed hyperæmia of the osteo-arthritic femoral head and attributed much of the joint pain to attempts at repair rather than degenerative changes.

Ewing (1926) said that diminished vascularity was the first of the radiological effects on bone, but these cannot be divorced from the effect on soft tissues, such as the capsular and muscle attachments.

Kahlmeter (1938) found these tissues the most sensitive to irradiation in all forms of degenerative joint-disease.

The purpose of the present investigation was to determine the efficacy of radiotherapy in relieving the pain from osteo-arthritis of one large joint. By far the most important symptom to the patient is pain, and this is notoriously difficult to assess. The symptoms of osteo-arthritis tend to fluctuate irrespective of treatment, and there are no objective criteria. Moreover, patients, reluctant to disappoint those who have been trying hard to relieve their pain, often colour their replies accordingly.

Joly and Hanoune (1952) reported that pain was at least partly relieved in 66 of 295 patients treated by radiotherapy. Some of these patients had additional radiotherapy to the lumbar spine. Joly and Hanoune regard the most effective hip dosage as 1000–2000r in six doses in one week from a 150-kV apparatus.

It was felt that a more accurate assessment would be achieved by eliminating the personal factor of an interview and by sending a simple questionnaire to patients at least a year after treatment.

After an initial explanatory note, the following questions were asked:

After your X-ray treatment was your pain better, worse, or unchanged?

If the pain was altered, how long after treatment started did you first notice the alteration?

If your pain was altered, for how long did the alteration last?

Did you notice any other effects of the treatment?

All the patients in this investigation had received treatment by various physiotherapeutic methods, with only partial relief or none at all. All the patients were either moderately or severely disabled; 14 of them were subsequently subjected to major surgery when radiotherapy failed to give satisfactory relief of symptoms. The length of follow-up varied from eighteen months to seven years, and possibly further patients will require surgery later.

Results

Of 62 patients treated 59 were traced: 29 men, average age 59, and 33 women, average age 58, when treatment began. 2 of these patients had later died, each about two years after treatment and of unrelated causes; both had moderate improvement, which was maintained until death. Of the remaining 57 patients 11, with twelve treated hips, had subjective improvement,

but this lasted for more than a year in only 5 patients. Improvement was considerable in 3, moderate in 6, and slight in 2. The average duration of symptoms before treatment was six years.

Ill effects of treatment were few : 2 patients complained of malaise and abnormal tiredness ; 1 woman, aged 46, had persistent amenorrhœa after treatment—she was the only patient who found the pain increased by treatment.

43 patients could not detect any appreciable effect of radiotherapy.

Conclusions

Radiotherapy may be given in a dose of 1200–1500r to a hip-joint in 6–10 fractions in two weeks with few complications due to treatment.

Less than a quarter of 57 patients with osteo-arthritis of the hip derived subjective benefit from irradiation of the hip-joint. In only 5 patients did benefit last longer than a year.

I wish to thank Mr. S. L. Higgs, Mr. H. Jackson Burrows, Mr. W. D. Coltart, Mr. I. G. Williams, and Dr. A. E. Jones for permission to publish this paper.

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PSEUDOHÆMOPTYSIS DUE TO CHROMOBACTERIUM PRODIGIOSUM

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IT is common knowledge that a green or blue tinge to the sputum may be produced by *Pseudomonas pyocyanea*. It is far from common knowledge, however, that a red sputum, indistinguishable from a bloodstained specimen, may be produced by *Chromobacterium prodigiosum*. Ignorance of this fact, even among chest physicians, is easily explained, for up to 1955 it has been possible to trace only two cases of natural infection of the respiratory tract with this organism.

The classification of the chromobacterium group of organisms has always been somewhat difficult. They are small gram-negative aerobic rods producing a pigment which may be yellow, violet, or red. *C. prodigiosum* may vary morphologically from a coccobacillus to a rod. The group is usually found in water and soil and may contaminate food (Wilson and Miles 1955).

Most infections in man with *C. prodigiosum* have involved the genito-urinary tract (Wheat et al. 1951), but cases have been described of fatal septicæmia (Patterson et al. 1952), bacterial endocarditis (Hawe and Hughes 1954), and meningitis (Aronson and Alderman 1943). The type of case described below has rarely been published.

Case-report

On July 19, 1956, a man, aged 59, was admitted to hospital because of a chronic cough and copious purulent sputum ; these symptoms had been present since an attack of pneumonia five years previously. His temperature and pulse-rate were normal, and a general examination showed little of note except finger clubbing, generalised emphysema, and bilateral basal crepitations in the lungs. Naked-eye examination of the sputum, however, showed it to contain pus, and it appeared to be frequently bloodstained. A blood-count showed red cells 4,620,000 per c.mm., Hb 56%, colour-index 0·6, and white cells 5000 per c.mm. Bronchiectasis was diagnosed and confirmed by bronchography, which demonstrated "cystic" bronchiectasis of both lower lobes, the middle lobe and lingula, and the anterior segments of the upper lobes. Bronchoscopy revealed pus in both lower-lobe bronchi which were also appreciably distorted. Specimens of sputum did not supply any microscopical evidence of blood, and it was subsequently noted that the red colour of the sputum developed only on standing. Cultures were reported consistently as growing *C. prodigiosum* and *Proteus mirabilis* ; the former organism produced luxuriant orange-red colonies. In spite of treatment with penicillin, streptomycin, terramycin, aureomycin, and chloramphenicol, the patient continued to produce cultures of this organism. These cultures were resistant to all in-vitro drug-sensitivity tests except as regards chloramphenicol and neomycin. However, the patient's general condition was much improved—possibly owing to effective physiotherapy—and he was discharged home on Aug. 28, 1956.

Bacteriology.—The organism consisted of short gram-negative rods (about 1·0–1·5 × 0·7 μ, with occasional rods up to 4 μ long), motile by a few peritrichate flagella. It formed round convex colonies with a smooth shiny surface on agar, and grew better at 37°C than at 25°C. It produced deep orange-red pigment on agar at 25°C but little or no pigment at 37°C. The pigment was insoluble in water but soluble in chloroform and in alcohol. An alcoholic solution of pigment turned pink, then violet, on the addition of acid, and yellow on the addition of alkali. The organism grew anaerobically without producing pigment. It produced dense turbidity in broth at 25°C, with a pink ring growth and a reddish deposit. It produced clot in litmus milk, followed by liquefaction. Saccate liquefaction was caused by a gelatin stab. It produced acid and a little gas from glucose, mannitol, maltose, sucrose, and salicin at 37°C, but none from dulcitol and lactose. Glucose was attacked fermentatively (Hugh and Leifson 1953). Indole –, M.R. –, V.P. +, Koser's citrate +, nitrates reduced, NH3 production +, catalase +, methylene-blue reduced, urea – at 24 hr. (Christensen 1946), H_2S. +. The description of this organism closely resembles that given for *C. prodigiosum* by Wilson and Miles (1955). A culture has been deposited with the National Collection of Type Cultures (no. 9940).

Discussion

There seems to be little doubt, from a review of published reports, that this organism can produce either a mild chronic illness or a fulminating fatal one, usually a septicæmia. It is, of course, very difficult to assess the pathogenicity of the organism in the present case. It is of interest that the sputum remained persistently contaminated in spite of heavy and varied antibiotic therapy. These findings are in keeping with the experience of most other workers. Hawe and Hughes (1954) thought that either chloramphenicol or neomycin might offer the best chance of successful treatment. The in-vitro sensitivity tests tend to bear out this view.

Aïtoff et al. (1936) have described a case in which a pure culture of *C. prodigiosum* was obtained from a patient with lobar pneumonia. Woodward and Clarke (1913) described a case quite similar to the one described above ; the patient, who apparently had bronchiectasis, complained repeatedly of bloodstained sputum, whereas it really contained no red corpuscles but grew profuse colonies of *C. prodigiosum*. Sometimes the red colour of the sputum occurs only on standing, the degree of pigmentation depending on the oxygen supply.

We wish to thank Dr. M. T. Parker and Dr. J. D. Abbott for investigating and reporting on the bacteriological aspects of the case.

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HÆMOLYTIC TRANSFUSION REACTION DUE TO ANTI-KELL

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EMERGENCY blood-transfusions may later lead to "emergencies" of a different kind. The following case illustrates one of the complications which may arise if the tests preceding this treatment are not carried out completely.

Case-report

A married woman, aged 30, became pregnant for the second time in August, 1955. She had had no serious illnesses in the past and had certainly never received any blood-transfusions or injections of blood. Apart from one normal live birth there had been no other pregnancy. On April 12, 1956, she attended the antenatal clinic for the first time, and intra-uterine death was suspected. A swelling in her neck was noted and diagnosed as tuberculous adenitis. On April 15, in her 36th week of pregnancy, she was admitted to hospital with vaginal bleeding and abdominal pain. Next morning a dead 20-week fœtus was born, and this was followed two hours later by a fairly severe postpartum hæmorrhage. An urgent request for three pints of blood was received by the pathologist on duty. The patient's blood-group was determined as group A rhesus-negative. Three pints of homologous blood was cross-matched by the albumin method, being incubated for an hour at 37°C, and all three bottles were found to be compatible. An indirect Coombs test was not done.

Transfusion and Progress.—Two pints was transfused immediately and given fairly quickly. The third pint was given during the morning of April 16. The patient's general condition improved, but in the afternoon she was found to be jaundiced. On April 17 she became anuric. Since the usual Bull's régime was not tolerated, owing to constant vomiting, 5% glucose in water was given by mouth, followed by 40% glucose by intragastric drip. When, by April 20, diuresis had not begun an intracaval drip (Russell et al. 1954) was set up and 40% glucose administered. Insulin was given in an attempt to stem the rising serum-potassium level. Diuresis started on April 24, when she passed 160 ml. of urine, and the amount of urine increased during the following forty-eight hours. Infection of the surrounding skin made it necessary to remove the intracaval catheter on April 26. Next day the serum-potassium level rose to 9·2 m.eq. per litre and reached 10·2 m.eq. per litre on April 28. By this time a massive diuresis had set in (4 litres in twenty-four hours), and the serum-potassium level dropped to 5·0 m.eq. per litre on April 30. The blood-urea level rose to 252 mg. per 100 ml. on the same day but declined rapidly thereafter. Polyuria went on for another week, with the serum-potassium dropping to 3·3 m.eq. per litre. The patient's general condition improved, but persistent anæmia necessitated a further blood-transfusion. She was well enough on May 23 to be discharged home, when her blood-urea was normal and her hæmoglobin 9·3 g. per 100 ml. (63%).

Follow-up.—By June 11 her hæmoglobin had increased to 10·9 g. per 100 ml. (74%) and on Nov. 15 it was 12·3 g. per 100 ml. (83%), and her blood-urea was 19 mg. per 100 ml.

Biochemical and Serological Findings.—The clinical diagnosis of hæmolytic transfusion reaction was confirmed by a positive Schumm's test and a bilirubin level of 14 mg. per 100 ml. on the evening of April 16. The patient's cells on this date gave a positive direct Coombs test. Reinvestigation of the serology showed that her blood-group had been correctly determined as group A rhesus-negative, and the donors' blood-groups were also found to be correct. The cross-match was now repeated with serum obtained from pre- and post-transfusion specimens, and again no incompatibility was found when the cells and the specimen were suspended in saline solution or in albumin, but two of the three pints of blood gave a strongly positive indirect Coombs test with the patient's serum. A full investigation then showed that the antibody present in the patient's serum was anti-Kell. The two bottles which gave the positive indirect Coombs test with the patient's serum were Kell-positive, whereas the third, which had given a negative indirect Coombs test, was Kell-negative. The blood-group of the patient's husband was group O rhesus-negative, Kell-positive, and Fy (a-).

Discussion

This patient was not regarded as a "dangerous recipient" (Tovey 1950), having had only one pregnancy in the past and no history of transfusion or injections of blood. Nevertheless her serum contained a powerful anti-Kell antibody obviously produced by the stimulus of the pregnancies. Whether the tuberculous adenitis enhanced antibody formation is a matter for conjecture. Unfortunately the dead fœtus was not examined, and cord blood was not obtained. Therefore it is unknown whether the Coombs test in the baby's cells was positive. No doubt the severe transfusion reaction could have been avoided had a Coombs test been done when the blood was cross-matched, but it was assumed that the case was too urgent to allow time for this test. It is common experience that the albumin method will not show up all antibodies which may produce a severe transfusion reaction. The performance of the indirect Coombs test therefore appears to be advisable in all women who have been pregnant or cannot give a precise history.

This case again shows the value of the intracaval administration of hypertonic glucose in the treatment of anuria.

Summary

A severe hæmolytic transfusion reaction was due to an anti-Kell and caused anuria. An indirect Coombs test should be used more often than at present in cross-matching blood for parous women.

Our thanks are due to Mr. H. Burton for permission to publish this case.

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New Inventions

A NEW RECOVERY-ROOM TROLLEY

IN a recovery-room, the use of a standard hospital bed has many disadvantages. It is space consuming where the space is often limited, it is cumbersome to move and tilt, and a fixed head makes laryngoscopy or bronchoscopy extremely difficult. Moreover, it entails too frequent movement of the patient who is shocked or has had regional or hypotensive anæsthesia, in that he has to be moved from operating-table to trolley, thence to a recovery bed and later back to a trolley, and finally back to a bed again in the surgical ward. These manœuvres require the close attention of several nurses and porters.

To eliminate such difficulties, a recovery-room trolley has been designed incorporating features which allow the patient to remain on it from the time he leaves the theatre table, throughout his stay in the recovery-room, to the time he returns to the ward. Thus he has to be moved only twice.

This trolley is basically similar to the standard hospital trolley. It is, however, more sturdily built and has the following additional features:

(1) Easily adjustable Trendelenburg tilt by means of a handle at the foot.

(2) Adjustable self-locking shoulder-rests.

(3) Detachable side-rails with telescopic ends which stow away in a compartment beneath the trolley when not in use.

(4) Adjustable drip-stand attachment on either side of the trolley.

(5) Container for oxygen cylinder beneath trolley.
(6) Tray beneath trolley for case-sheets, utensils, dressings, &c., brought from the ward.
(7) Locking wheels (foot action).
(8) Thick 'Sorbo' rubber mattress.

As the trolley stands just higher than a standard hospital bed, the patient who is on a draw-sheet can be lifted with a minimum of effort on to the ward bed when required. Two of these trolleys have been in use in the recovery-room at the Royal Infirmary, Wigan, for some months and have proved so satisfactory that it is proposed to replace the remaining beds by more such trolleys soon.

The trolley is manufactured by Messrs. Siddall & Hilton, of Sowerby Bridge, Yorks, to whom considerable credit is due for their lively interest and coöperation in its production.

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Reviews of Books

The Pathogenesis of Coronary Occlusion

A. D. MORGAN, M.A., M.D., head of the morbid anatomy department and reader in pathology, Westminster Medical School, and consultant pathologist, Westminster Hospital, London; Oxford: Blackwell Scientific Publications. 1957. Pp. 171. 42*s*.

SINCE ischæmic heart-disease is now responsible for the deaths of one fifth of the nation, and coronary atherosclerosis is present to a greater or lesser extent in every adult irrespective of age, a new monograph on the pathogenesis of coronary atheroma commands immediate attention.

In the first half of this monograph, which is based on his M.D. thesis, Dr. Morgan recounts briefly the early history of coronary atherosclerosis and reviews some of the theories of atherogenesis. The historical section is very interesting, but the review lacks continuity and does not analyse or summarise adequately the views of previous workers. Many will take issue with Dr. Morgan's acceptance of atherosclerosis as an inevitable result of advancing age, with metabolic and endocrine disturbances as merely aggravating factors.

In the second half, he recapitulates Duguid's views concerning the formation of atherosclerotic lesions. During the past ten years most pathologists have come to realise that there is much evidence to support Duguid's observations that wisps of fibrin and frank arterial thrombi can be overgrown by endothelium and incorporated into the arterial wall. Duguid maintains that many atherosclerotic lesions result from fibrin deposition and thrombosis, and that much of the fatty material in the atherosclerotic plaque is the result of degenerative changes. Dr. Morgan supports these observations with a detailed histological study of the coronary arteries from 40 patients with advanced coronary atherosclerosis; there are 174 photomicrographs and many of these are admirable, though only the frontispiece is in colour. In Dr. Morgan's view, intimal vascularisation is entirely the result of retraction and organisation of mural thrombi. He believes that most of the cholesterol in the atherosclerotic plaque comes from the breakdown of red cells after mural thrombosis or capillary hæmorrhage into an existing plaque, and that it is possible to account for the presence of cholesterol in an atherosclerotic abscess without necessarily invoking a disorder of lipid metabolism.

It would have been better if this monograph had been confined either to the excellent histological studies or expanded into a more comprehensive account of other views of the pathogenesis of coronary atherosclerosis; the present title is misleading, since the monograph is really an exposition of one view of atherogenesis. Dr. Morgan contends that the increasing incidence of thrombotic arterial occlusion is largely responsible for the greater frequency of ischæmic heart-disease. He offers no evidence to support this hypothesis which, if the thrombogenic theory is correct, is difficult to reconcile with the fact that coronary atheroma has not increased during the past half century—a distinction which Dr. Morgan himself emphasises.

Dr. Morgan is an enthusiastic advocate of Duguid's thrombogenic theory of the origin of atheromatous lesions, and it is instructive to read a review of this important approach to atherogenesis.

Clinical Use of Radioisotopes

WILLIAM H. BEIERWALTES, M.D., coördinator, clinical radio-isotope unit, University Hospital, Ann Arbor; PHILIP C. JOHNSON, M.D., chief, radio-isotope unit, Veterans Administration Hospital, University of Oklahoma; ARTHUR J. SOLARI, M.S., radiation physicist for clinical radio-isotope unit and Kresge research isotope unit, University Hospital, Ann Arbor. Philadelphia and London: W. B. Saunders. 1957. Pp. 456. 80*s*. 6*d*.

WRITTEN primarily for the doctor taking part in the development of a clinical radio-isotope unit, this book gives a particularly clear account of the principles underlying the use and measurement of radioactive materials, which should be very valuable to the medical graduate, who may have only a very superficial knowledge of nuclear physics.

Most attention on the clinical side is rightly devoted to thyroid disorders and radioactive iodine, since this is undoubtedly the most important and popular use of an isotope in hospital. Practical therapeutic aspects are well covered and for the most part the advantages and limitations of the new methods are adequately presented. Little is said about the more fundamental aspects of the nature of the action of radiation on the thyroid cells, and recent work on carcinoma of the thyroid in children resulting from irradiation of the neck is not included. In the chapter on diagnostic procedures no mention is made of the possible use of the short

half-life ^{132}I, which considerably reduces the exposure of the gland to radiation.

After turning to the use of other radioactive isotopes in clinical investigation and treatment, the book deals with the biological effects of radiation. It concludes with the practical details of measuring radioactivity, and it even goes into the costs of investigations and the charges to be made to patients. In an American book the regulations regarding the supply of isotopes do not, of course, apply to laboratories in this country.

Doctors beginning work in a department using radioactive materials in clinical investigation will certainly find much to help them in this book.

Medical Negligence

LORD NATHAN, P.C., solicitor of the Supreme Court, chairman of the board of governors of Westminster Hospital; with the collaboration of ANTHONY R. BARROWCLOUGH, B.A., of the Inner Temple, barrister-at-law. London: Butterworth. 1957. Pp. 218. 35*s*.

THIS book collects much material hitherto available only in scattered reports. It should interest lawyers and doctors alike, and is intelligible to both. It demonstrates the care taken by the courts to reach decisions which not only do justice to plaintiffs but also protect a doctor's reputation when it deserves protection. The standard of care is decided by the judge after weighing evidence given by other doctors; it is not a subjective standard of his own. The frequent reiteration of the words "reasonable care" should comfort those who think that the courts demand the highest possible degree of skill and experience. In the words of Lord Justice Scott, "the standard of care which the law requires is not insurance against accidental slips; it is such a degree of care as a normally qualified member of the profession may reasonably be expected to exercise in the actual circumstances of the case in question." Many examples are given of the "actual circumstances," but non-legal readers should remember that there is little law in these cases. Each has been decided on its own facts, and few can safely be treated as precedents.

The author suggests that all that solicitors need do to secure immunity from actions for professional negligence is to act on the opinion of counsel of reasonable competence. It is perhaps worth noting, therefore, that solicitors are sometimes sued for negligence where there has never been any question of referring the case to counsel. They are in no better a position than many a doctor. Doctors have been found guilty of negligence because they did not refer the case to another doctor with special skill or knowledge, and the inference is that, had they done so, they themselves would have been immune.

The book contains just over 200 pages, some of which are not strictly concerned with medical negligence, and many of the cases are not English but are from the Dominions and the United States. Does this suggest that doctors in this country are not, after all, forever hovering on the edge of a legal abyss?

Troubles mentaux au cours des tumeurs intracraniennes

H. HECAEN, médecin des hôpitaux psychiatriques; J. DE AJURIAGUERRA, maître de recherche á l'Institut National d'Hygiène. Paris: Masson. 1956. Pp. 152. Fr. 1500

THE partnership of Hecaen and Ajuriaguerra is becoming well known in modern French neurological literature. Their contributions are always of value, and though this monograph is slighter than some of their work it contains useful information and a full review of previous literature.

This study is based on 449 cases of cerebral tumour, in 229 of which mental changes were present. The findings show that, though raised intracranial pressure (as judged by papilloedema) plays a part in producing general mental changes, this is not the whole answer. When both the type of mental change and the site of the tumour are considered, the most striking fact is the relatively high incidence of a Korsakoff syndrome in lesions of the diencephalon: and this supports the histological evidence in cases of alcoholic Korsakoff psychosis. A more generalised "confusion-dementia" syndrome commonly arises in frontal and fronto-temporal tumours, whether or not papilloedema is present, whereas in occipital or posterior-fossa tumours this syndrome is usually associated with papilloedema.

In general, the book confirms the experience of those who see a lot of cerebral tumours, and it will be of particular value to psychiatrists who wish to define the rather amorphous group of organic dementia syndromes that they see.

Atlas der gastroenterologischen Cytodiagnostik

N. HENNING, director, and S. WITTE, scientific assistant, Med. Univ.-Klinik, Erlangen. English translation by R. O. K. SCHADE, M.R.C.S. Stuttgart: Georg Thieme. 1957. Pp. 104. D.M. 38.

THIS unpretentious atlas includes German and English versions in one cover, and the sound English translation makes the book unusually valuable to students of scientific German. The text, less than 20 pages in each version, is disappointingly brief: it includes, for instance, no statistics on the reliability of the methods described. Professor Henning has been using his *Zelltupfsonde* (a gastric-tube-enclosed swab) in the diagnosis of gastric carcinoma since 1948, and exact figures of his success with it would have been very informative. The black-and-white figures are many and good. The gut is one of the newer and more difficult fields of exfoliative cytodiagnosis, and this is a useful introduction to it.

Companion in Surgical Studies (2nd ed. Edinburgh: E. & S. Livingstone. 1957. Pp. 1302. 84*s*.).—A man seldom erects a monument to himself in his own time; but Prof. Ian Aird has done so. The first edition of his Companion had the quality of a "standard work" to which everyone turns for reference. For the second edition he has an editorial committee of members of the staff of the Postgraduate Medical School of London and the Hammersmith Hospital to assist him, and together they have enlarged the book considerably. Professor Aird has made no concession to those who deplored the absence of orthopædics from the first edition; he feels he has been out of touch with the subject for too long. He should have stuck to his guns about illustrations too: it seemed almost a merit of the first edition that it had none; now there is one plate and one diagram, neither of any importance, lost in the text, and they will hardly satisfy the critics who disliked a book without illustrations. Nevertheless the second edition maintains the great reputation of its predecessor, and will indeed enhance it.

Symptoms and Signs in Clinical Medicine (6th ed. Bristol: John Wright & Sons. 1957. Pp. 508. 35*s*.).—Dr. E. Noble Chamberlain's well-known introduction to clinical medicine is now by way of becoming a minor classic. In the new edition there have been changes, notably in the sections devoted to the cardiovascular and central nervous systems. There are some new illustrations, including excellent coloured photographs. Indeed, it seems a pity that any of the old coloured drawings were retained, for some of them now look very poor by comparison, and one or two are out of date and inaccurate. We again commend this popular book to all students.

Cleft Lip and Palate (2nd ed. London: Heinemann Medical Books. 1957. Pp. 187. 42*s*.).—The value of Mr. W. G. Holdsworth's book has been much enhanced. The chapters on operative repair include much new material and they now present a concise but comprehensive review of almost every surgical possibility. A new chapter on embryology, contributed by Prof. R. J. Harrison, is a masterly exposition of a complicated subject and goes far towards explaining some abnormalities which had hitherto been difficult to fit into the developmental pattern. The second major addition, a chapter on orthodontic treatment by Mr. M. A. Kettle, places in correct perspective the many claims made in this specialty, and enables the advantages of treatment to be properly evaluated. Altogether, this new edition is vastly more informative than its predecessor.

Shaw's Textbook of Gynæcology (7th ed. London: J. & A. Churchill. 1956. Pp. 704. 32*s*. 6*d*.).—Wilfred Shaw's well-known textbook was first published in 1936. Mr. John Howkins has undertaken the revision for the new edition, and he is to be congratulated on maintaining the high standard and on preserving much of the original text while bringing the teaching up to date. 116 new illustrations have been included and a number of important chapters have been largely rewritten.

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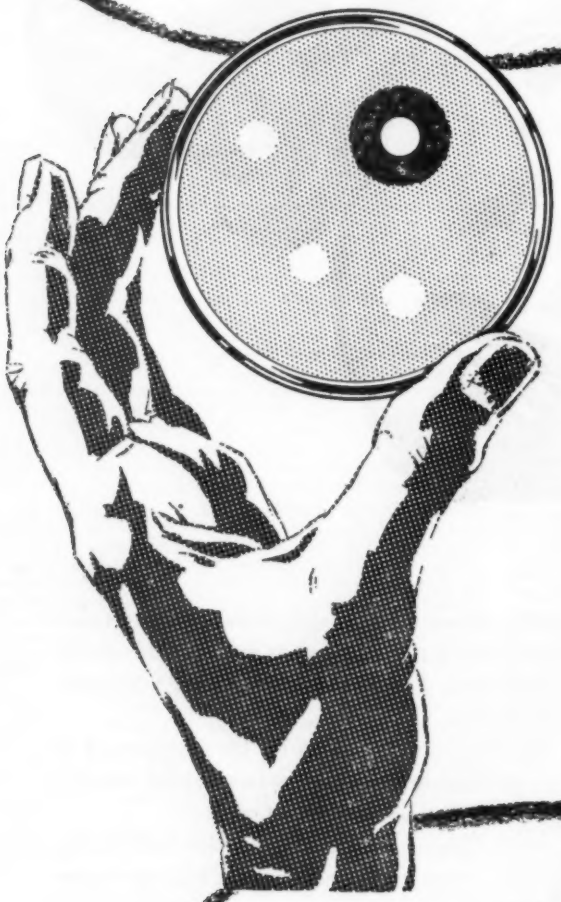

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THE LANCET

LONDON: SATURDAY, APRIL 20, 1957

Vaccination and the Epidemiology of Poliomyelitis

RECENT studies have made clear the reasons for the striking differences in the incidence of paralytic poliomyelitis between countries with high and with low standards of living.[1,2] In countries with a low standard of living people are usually infected by poliovirus in infancy or early childhood and thereafter they have a lifelong immunity to paralytic disease, whereas in countries with a higher standard of living and hygiene the first contact with poliovirus may be postponed to an age at which paralytic disease is more likely to result from infection. MELNICK et al.[3] now report the results of a three-year study of selected populations in two American cities. Specimens of sera and stools were collected repeatedly and were used to measure the infection-rates of different sections of the population in relation to their general socio-economic standards. It was found that in each city members of the lower socio-economic group developed antibody early, and more than half of those aged 5–9 had antibody to any given type of poliovirus; in higher socio-economic groups the same figures were not reached until early adult life. These differences were clear on a gross district level; but, within each district, household size and state of sanitation were not important determinants of infection-rates. The rates of virus isolation were more than three times greater in the lower socio-economic group, and in certain cases it was possible to observe in retrospect silent subclinical epidemics in different districts. There were no clinically apparent cases of poliomyelitis in the study-groups; but since clinical cases occurred elsewhere in both cities during the period of observation it was possible, by assuming similar infection-rates to those of the study-groups, to compute crude ratios of clinical to inapparent infections. A rough calculation of this type suggested that the number of subclinical infections per clinical case varied from 32 to 496, clinical cases being associated most frequently with type-1 viruses. Another interesting finding in this investigation[4] was that the presence of heterotypic antibodies did not reduce the incidence of subclinical infections among exposed persons. On the other hand, the possession of homotypic antibody as a result of previous infection apparently prevented reinfection—a finding which falls in line with the work of others.[5] A general conclusion from this work is that within relatively well-defined areas the age at which infection with polioviruses is acquired differs sharply, and these differences can be clearly related to socio-economic rather than to climatic conditions. A similar conclusion is reached by Dr. BACKETT, whose report we published last week.[6] BACKETT studied the poliovirus antibody pattern of nearly 300 children in Northern Ireland in relation to factors in their social background. He found that there is more evidence of infection among children living in town than in country children, in lower than in upper social classes, in homes without constant hot water than those with, and among children with many recreational contacts than those with few; and each of these factors seems to be independently associated with antibody patterns. It is important that studies of this kind[7] should have been made now, since the picture may soon be greatly altered as the result of vaccination.

What effects on the epidemiology of poliomyelitis may be expected to result from the continued use of formolised poliomyelitis vaccine? A very thoughtful paper by Dr. JOHN PAUL[8] raises important issues. PAUL points out that so far the vaccine has produced "acute immunity," which has reduced the incidence of paralytic poliomyelitis in children by 60–80%. But we do not yet know whether vaccination of children by existing methods will protect them until they have reached the young adult age, at which infection is more likely to cause severe paralytic disease. At the moment young adults in many populations are very vulnerable to paralytic disease. In the U.S.A. young parents are increasingly being infected by their children who have acquired virus at nursery-school, and it will be remembered that many parents became infected when their children accidentally received live virus during the so-called Cutter incident in 1955.[9] Unlike natural infection, vaccination does not prevent inapparent alimentary infections. This has two implications. When children are vaccinated first, the young parents may for a time be more commonly exposed to the risk of paralytic infection as a result of inapparent infection by virulent virus in their children. Secondly (as PAUL remarks), natural alimentary infection in a vaccinated child may still be necessary to maintain immunity throughout life. Where and when these natural infections will occur may depend largely on the child's social circumstances. Finally, PAUL raises the question whether reinfection should be left to pure chance, or whether vaccination with live attenuated virus should be used as an adjunct to the vaccination with a killed virus. Although the development of live-virus vaccine has had a setback[10] this still seems a logical and hopeful line to pursue.

1. World Health Organisation. First Report of the Expert Committee on Poliomyelitis. *Tech. Rep. Ser. Wld Hlth Org.* 1954, no. 81.
2. Paul, J. R. *Monogr. Ser. Wld Hlth Org.* 1955, **26**, 9.
3. Melnick, J. L., Walton, M., Isacson, P., Cardwell, W. *Amer. J. Hyg.* 1957, **65**, 1.
4. Isacson, P., Melnick, J. L., Walton, M. *Ibid*, p. 29.
5. Fox, J. P., Gelfond, H. M., LeBlanc, D. R., Conwell, D. P. *Amer. J. publ. Hlth*, 1956, **46**, 283.
6. Backett, E. M. *Lancet*, April 13, 1957, p. 778.
7. Fallon, R. J. *Ibid*, 1956, i, 65.
8. Paul, J. R. *J. Amer. med. Ass.* 1956, **162**, 1585.
9. See *Lancet*, 1955, i, 1207.
10. Dane, D. S., Dick, G. W. A., Connolly, J. H., Fisher, O. D., McKeown, F. *Brit. med. J.* Jan. 12, 1957, p. 59.

Mechanisms of Periodic Paralysis

ONE of the things which makes medicine difficult (and interesting) is that apparently similar syndromes can be produced by several distinct mechanisms. Familiar examples are megaloblastic anæmia and renal failure; and there is now a good deal of evidence that episodic paralysis, even in the absence of neurological disease, can be produced in different ways. The first mechanism that was apparently established was the low plasma-potassium level giving rise to attacks of familial periodic paralysis; attacks can be terminated by giving potassium salts by mouth, and can be induced by giving adrenaline, or insulin and glucose, which lower the plasma-potassium.[1] ALLOTT and MCARDLE [2] observed that the fall in plasma-potassium associated with the onset of an attack could not be accounted for by increased urinary excretion of potassium, and inferred that there must be a shift of potassium from the extracellular fluid into the cells. Further balance studies have confirmed this finding.[3] Last year ZIERLER and ANDRES [4] showed that there was a nocturnal shift of potassium into muscle-cells, which was five to ten times greater in patients with periodic paralysis than in healthy people. The observed rate of entry into muscle of up to 1 m.eq.K per hr. per kg. of muscle would well account for the concurrent disappearance of potassium from the extracellular fluid (E.C.F.); and it is tempting to relate the nocturnal entry of potassium into muscle to the tendency for attacks of periodic paralysis to start in the early hours.

The association between hypokalæmia and paralytic attacks has now been observed not only in some patients with familial periodic paralysis but also in patients with abnormal losses of potassium, as in diabetic coma, the Fanconi syndrome,[5] and potassium-losing nephritis [6]; yet evidence has also accumulated that hypokalæmia does not necessarily lead to paralysis and that familial episodic paralysis can occur without hypokalæmia. Reviewing the relation between potassium and familial periodic paralysis, MCARDLE [7] draws attention to the common absence of paralysis at levels of plasma-potassium well below those associated with paralysis in the familial syndrome, and on the other hand to the remarkable family reported by TYLER et al.[8] In this family episodic paralysis was inherited as a simple mendelian dominant, with 33 affected patients in seven generations; the paralytic episodes were not attended by any notable change in plasma-potassium, but biopsy showed vacuolation in the muscles. The vacuoles did not contain fat or glycogen, and were presumed to contain "œdema fluid," although they lay within the muscle-fibres. The relationship between potassium and paralysis is further complicated by the observations that hyperkalæmia may also be associated with paralysis,[9 10] and that hypokalæmia may at times be associated not with paralysis but with tetany,[11] while in other patients the correction of hypokalæmia has unmasked hypocalcæmic tetany.[12]

It is apparent from all this that no simple relationship exists between plasma-potassium and muscle paralysis; and speculative enterprise has tended to emigrate to the terra incognita within the cells. A new lead in this direction is given by Professor CONN and his colleagues in their interesting observations set out in this issue on p. 802. They outline their findings in two patients, unrelated to each other, who had "the familial type of periodic paralysis"; one of them lived in the laboratory for eleven months of metabolic observation, and the other was studied for thirty days. Both spontaneous and induced attacks of paralysis were preceded by massive retention of sodium and increased urinary excretion of aldosterone; recovery from the attack was attended by massive sodium diuresis. Muscle biopsy during the attack showed a vacuolated lesion like that found in TYLER'S family; but the two syndromes are not identical, for in CONN'S 2 patients there was a profound fall in urinary and plasma potassium. The sodium content of muscle was greatly increased, while the potassium content of muscle was normal, or a little diminished. (The results now published do not indicate conclusively that the extra sodium in muscle is in fact intracellular, but a more detailed account is promised.) When the patients were put on a low-sodium diet, it was no longer possible to induce attacks by glucose+insulin, or by fluorohydrocortisone. On the basis of their findings, CONN et al. suggest that "an abnormally high concentration of sodium within the muscle cell is partly responsible for the disturbance of muscle function." The cause of the observed intermittent aldosteronism is "not yet clear"; and on the present results the possibility does not seem to be completely excluded that the increased aldosterone output is a secondary response to decreased E.C.F. volume from a prior shift of fluid into cells along with potassium.

This valuable new information raises further questions which can be readily studied. Does artificial lowering of the plasma-potassium by insulin+glucose or by fluorohydrocortisone induce aldosteronism in healthy people, and if so how is this related to the stimulation of aldosterone output by a high potassium intake? [13] If the aldosterone change is "primary," why is the sodium retention not accompanied by massive loss of potassium in the urine, as in sustained primary aldosteronism? [14] If the intracellular vacuoles do contain sodium salts, by what mechanism are they sequestrated within the cell? What part, if any, do the diurnal variations observed by ZIERLER and ANDRES play? As MCARDLE [7] points out, quite a small primary change in extracellular potassium level may trigger off a chloride shift which will lead to further drastic lowering of external potassium; and it is notable that in 1 of the 2 patients studied by DANOWSKI et al.[3] there was a negative external balance of potassium before the attack.

From the practical point of view, perhaps the most interesting observation was that on a sodium intake

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2. Allott, E. N., McArdle, B. *Ibid*, 1938, **3**, 229.
3. Danowski, T. S., Elkinton, J. R., Burrows, B. A., Winkler, A. W. *J. clin. Invest.* 1948, **27**, 65.
4. Zierler, K. L., Andres, R. *Ibid*, 1956, **35**, 747.
5. Milne, M. D., Stanbury, S. W., Thomson, A. E. *Quart. J. Med.* 1952, **21**, 61.
6. Mahler, R. F., Stanbury, S. W. *Ibid*, 1956, **25**, 21.
7. McArdle, B. *Brit. med. Bull.* 1956, **12**, 226.
8. Tyler, F. H., Stephens, F. E., Gunn, F. D., Perkoff, G. T. *J. clin. Invest.* 1951, **30**, 492.
9. Finch, C. A., Marchand, J. F. *Amer. J. med. Sci.* 1943, **206**, 507.
10. Bull, G. M., Carter, A. B., Lowe, K. G. *Lancet*, 1953, ii, 60.
11. Fourman, P. *Ibid*, 1954, ii, 525.
12. Engel, F. L., Martin, S. P., Taylor, H. *Bull. Johns Hopk. Hosp.* 1949, **84**, 285.
13. Laragh, J. H., Stoerk, H. C. *J. clin. Invest.* 1955, **34**, 913.
14. Conn, J. W., Louis, L. H. *Ann. intern. Med.* 1956, **44**, 1.

of 8 m.eq. a day there were no spontaneous attacks, nor could attacks be induced. The efficacy of a low-sodium diet may indeed be partly due to concurrent potassium retention; for BARTTER [15] has suggested that minimal excretion of sodium may depress potassium secretion through lack of sodium ion available for exchange. The diet used by CONN et al. in their studies is considerably more restricted than the conventional low-salt diet; it would therefore be of great interest to find out whether an ordinary low-salt diet would prevent spontaneous attacks, or whether this would have to be supplemented by mercurial or other diuretic agents. In some patients such a régime might have advantages over regular potassium supplements, which are not very palatable. We would certainly agree with CONN that adrenalectomy is not indicated in the management of periodic paralysis.

Resistant Tubercle Bacilli

THE possibility that drug-resistant tubercle bacilli might spread among the population was recognised when streptomycin was first used more than ten years ago. Instances of such spread have now been reported in the U.S.A.[16–19] France,[20–22] and Great Britain.[23–25] Studies in the U.S.A. suggested that resistant bacilli might account for about 1–2% of newly diagnosed infectious cases in that country [26 27]; but the information was incomplete. Accordingly, warnings about the dangers to the public health of indiscriminate and irrational chemotherapy of tuberculosis have been based on a-priori arguments. The tuberculosis research unit of the Medical Research Council, with the coöperation of many chest physicians, has now remedied this defect. FOX et al.[28] describe a survey of the drug-sensitivity of cultures of tubercle bacilli isolated from newly discovered patients in Great Britain between June, 1955, and March, 1956.

The bacteriological and statistical methods were designed to detect all strains which were at all resistant and to distinguish these from strains that were actually sensitive but were apparently resistant as a result of experimental variations in the sensitivity tests. MITCHISON and SELKON,[29] in a separate report on the bacteriological aspects of the survey, show that their estimates of the prevalence of strains resistant to streptomycin and *p*-aminosalicylic acid (P.A.S.), if incorrect, were likely to be too low, and that their estimate of isoniazid resistance may have been too high.

A representative sample of eighty chest clinics was selected by a random process. 1404 sputum specimens from the same number of newly diagnosed and untreated patients were cultured at a central laboratory. From these specimens 974 positive cultures were obtained; and 50 (5·1%) were resistant to one or more of the three commonly used drugs, 44 (4·5%) being cultures of *Mycobacterium tuberculosis* and 6 (0·6%) cultures of atypical mycobacteria. Of the 44 resistant cultures of *M. tuberculosis*, 22 (2·3%) were resistant to streptomycin, 21 (2·2%) to P.A.S., and 7 (0·7%) to isoniazid; 5 were resistant to more than one drug. In many instances the cultures were only slightly resistant, 19 of the 22 strains resistant to streptomycin having resistance ratios of no more than 16. But 3 strains were highly resistant to streptomycin, 11 to P.A.S., and 5 to isoniazid. 3 of the 7 strains resistant to P.A.S. were of bovine type and may, therefore, have been naturally resistant. [30]

At present probably 1 in every 20 newly diagnosed infectious patients in this country has resistant tubercle bacilli in the sputum. The prevalence varies with the age of the patient. The highest proportion of resistant cultures was obtained from young women; nearly 10% of the women aged 15–34 were infected with resistant bacilli—an alarmingly high proportion. On the other hand, only 3% of the men in this age-group had resistant cultures. The reasons for this unexpected difference between the sexes is unknown. In those older than 34 there was little difference—4·9% in women, compared with 4·1% in men. The prevalence also varied with the part of the country in which the patients lived, the rate being 8·3% in Scotland and 8·2% in the Liverpool area but only 2·5% in the Birmingham area and 1·6% in Wales. But the numbers of resistant strains from each area were small, and these differences may only have been chance fluctuations.

FOX and his colleagues also investigated the possible sources of infection of the 44 patients with primarily resistant cultures and compared their contact histories with those of 44 matched patients with sensitive strains. 47 contacts of the patients with resistant bacilli had been diagnosed as tuberculous since 1945, compared with only 16 contacts of the group with sensitive bacilli. Moreover, for each drug separately more of the resistant than of the sensitive group were known to have been in contact with patients treated with that drug—13 against 6 for streptomycin, 12 against 3 for P.A.S., and 3 against 0 for isoniazid. Definite evidence of contact with organisms known to be resistant was obtained from 10 of the 44 patients infected with resistant strains; but no such contact was found within the sensitive group. In at least half the patients infected with drug-resistant organisms the searching inquiry for contacts revealed nothing to arouse the clinician's suspicion that he might be dealing with a patient infected with resistant bacilli.

Some of the implications of this important piece of epidemiological research are clear. For the sake of the patient and the community all chemotherapy should be planned so that the risk of resistance is kept as small as possible. Probably many of the primarily resistant strains in this survey arose through treatment that would by present standards be judged inadequate and unsafe. It should now be very rare for a patient to remain infectious after chemotherapy.[31 32] It has been suggested that

15. Bartter, F. C. *Metabolism*, 1956, **5**, 369.
16. Furtos, N. C., Doane, E. A. *J. Amer. med. Ass.* 1949, **140**, 1274.
17. Brennan, A.J., Wichelhausen, R. H. *Ibid*, p. 1275.
18. Arany, L. S., Lewis, N. G. *Amer. Rev. Tuberc.* 1950, **61**, 881.
19. McCoy, H. I. *Ibid*, 1950, **62**, 227.
20. Brun, J., Kalb, J. C., Viallier, J., Pommateau, E. *Lyon méd.* 1950, **183**, 381.
21. Canetti, G., Saenz, A., Thibier, R., Chevassu-Perigny, J. *Rev. Tuberc., Paris*, 1951, **15**, 128.
22. Meyer, A., Naveau, P., Naveau, M. *Ibid*, p. 258.
23. Harold, J. T. *Lancet*, 1951, ii, 658.
24. Thomas, O. F., Borthwick, W. M., Horne, N. W., Crofton, J. W. *Ibid*, 1954, i, 1308.
25. Bruce, L. G., Cuthbert, J., Ritchie, J. A. *Scot. med. J.* 1957, **2**, 83.
26. Cummings, M. M., Livings, D. G. *Amer. Rev. Tuberc.* 1954, **70**, 637.
27. Chaves, A. D., Robins, A. B., Abeles, H., Petzer, L. R., Dangler, G., Widelock, D. *Ibid*, 1955, **72**, 143; *Ibid*, 1956, **74**, 293.
28. Fox, F., Wiener, A., Mitchison, D. A., Selkon, J. B., Sutherland, I. *Tubercle, Lond.* 1957, **38**, 71.
29. Mitchison, D. A., Selkon, J. B. *Ibid*, p. 85.
30. Wallace, A. T., Webber, W. J. *Ibid*, 1956, **37**, 358.
31. Crofton, J. W. *Brit. med. J.* 1956, i, 345.
32. Middlebrook, G. *Bull. int. Un. Tuberc.* 1956, **26**, 179.

treatment is less effective in older people [33]; but this is unproved and it seems improbable. (The current M.R.C. trial of long-continued chemotherapy should answer some of the questions about the response to treatment of this important group of patients.) The fact that almost a quarter of the patients infected with primarily resistant tubercle bacilli had been in contact with others known to be expectorating resistant bacilli suggests that preventive measures are not applied as efficiently as they might be. The well-known, but not always well-applied, preventive measures that are necessary in all infectious cases should be imposed with particular vigour when a patient remains infectious after chemotherapy. Sensitivity tests on all pre-treatment cultures are desirable, but not always practicable. In most cases in this country it is still possible to give effective treatment without such tests; but if the tests can be done the treatment can be more rational, more patients can be effectively treated, and the occasional discovery of primary resistant cultures will remind the physician of this danger. There is much to be said for starting treatment with all three drugs simultaneously in newly diagnosed patients if this is practicable and if the risk of vestibular disturbance after daily injections of streptomycin in the older patient is accepted; and if pre-treatment sensitivity tests can be done the results will indicate the most suitable combination of two drugs for further treatment.

33. Caplin, M., Griffiths, J. J., Silver, C. P. *Tubercle, Lond.* 1956, **37**, 233.

Annotations

THE BUDGET AND MEDICAL REMUNERATION

IN his Budget speech last week the Chancellor of the Exchequer declared that one of his aims was to increase the incentive to further effort by those earning over £2000 a year; and his proposals provide substantial relief for many in this group. Thus a man earning £3000 a year who is married and is educating three children aged 11–16 will have his tax reduced from £906 to £732. The difference of £174 represents a tax-free gain of about 6% of the gross income, which is almost comparable to the taxable 10% lately added to the salaries of junior hospital staff as an interim measure.[1]

The *Economist* [2] suggests that, with a view to ending the dispute over doctor's pay, the Government should fix the maximum sum that they are at the moment prepared to offer by way of "interim adjustment" and offer to negotiate with the medical leaders on its distribution. We should greatly welcome such arrangement. If the profession's negotiators found themselves at such a meeting their first thought would no doubt be for those who have not shared in the 10% increase for junior hospital staff and will benefit little if at all by the Budget proposals. We have in mind particularly senior hospital medical officers and family doctors with small practices.

HAZARDS OF EPOXIDE RESINS

IN the past few years a new group of synthetic materials, the ethoxyline or epoxide resins, has come into extensive use in industry, chiefly in the manufacture of electrical equipment, car bodies, and aircraft. Most of these resins are aliphatic-aromatic polyethers containing hydroxyl and terminal epoxy groups. When they are mixed with highly reactive hardeners, which are usually polyamines, they are transformed at room-temperature into solid infusible substances. Manufacturers of resins and hardeners are well aware of the hazards involved; but the introduction of these substances into works unfamiliar with chemical processes has resulted in many instances of toxicity.

Pletscher et al.[3] reported that, of 20 workmen handling one of these resins, 6 had severe eczema and 8 temporary skin irritation. On patch-testing, 4 of the affected 14 were hypersensitive to the resin, 2 to the hardener, and 3 to both substances. The 6 unaffected men were not hypersensitive. According to Grandjean,[4] the eruption associated with these resins has an initial phase, lasting from a week to several months, during which itchy erythematous patches appear on the face and upper limbs. In some people the reaction never proceeds beyond this stage, which may be due to primary irritation by the alkaline hardener or be an early manifestation of sensitisation to the resin. In others, further contact leads to a very irritating papulovesicular eruption; and at this stage the patient has to stop work.

Grandjean has formulated protective measures. The worker should be taught to avoid spilling the resin or hardener or contaminating door-handles or pencils. Good ventilation and local exhaust equipment are desirable. Workers should wear gloves, plastic cuffs, and white overalls; and their faces may be protected by barrier creams.

1. See *Lancet*, April 6, 1957, p. 746.
2. *Economist*, April 6, 1957, p. 24.
3. Pletscher, A., Schuppli, R., Reipert, R. *Z. Unfallmed. Berufskr.* 1954, **47**, 163.
4. Grandjean, E. *Brit. J. industr. Med.* 1957, **14**, 1.

VITAMIN A AND THE CEREBROSPINAL FLUID

DEFICIENCY of vitamin A is usually believed to give rise to nothing more severe than impairment of night vision. This opinion springs largely from the observations of Hume and Krebs [1] on male conscientious objectors, and we have little information about the possible effects on pregnant women and their children. Experimental studies suggest that slight deficiency of vitamin A early in pregnancy is very harmful to the fœtus. Warkany [2] stated that gross maternal deficiency of this vitamin led to abortion, and minor degrees of deficiency resulted in the birth of deformed young; the nervous system was often involved, and hydrocephalus was common. It was thought that abnormality of bone growth was primarily responsible for the hydrocephalus [3 4]; but recent evidence runs counter to this opinion.

Millen et al. [5 6] found that young rabbits born to does deficient in vitamin A were constantly hydrocephalic. Although stenosis of the aqueduct was found, these workers thought that the hydrocephalus was caused by over-production of cerebrospinal fluid (C.S.F.) rather than obstruction of its circulation or reabsorption. Vitamin A was known to cause a fall in the C.S.F. pressure of hydrocephalic vitamin-deficient calves.[7]

Woollam and Millen [8] have now investigated the effects of vitamin-A deficiency on the C.S.F. pressure in chicks. In fifty normal chicks, the average pressure did not

1. Hume, E. M., Krebs, H. A. *Spec. Rep. Ser. med. Res. Coun., Lond.* 1949, no. 264.
2. Warkany, J. *Advanc. Pediat.* 1947, **2**, 1.
3. Mellanby, E. *Proc. Roy. Soc.* B. 1944, **132**, 28.
4. Wolbach, S. B., Hegsted, D. M. *Arch. Path. (Lab. Med.)*, 1952, **54**, 12.
5. Millen, J. W., Woollam, D. H. M., Lamming, G. E. *Lancet*, 1953, ii, 1234.
6. Millen, J. W., Woollam, D. H. M., Lamming, G. E. *Ibid*, 1954, ii, 679.
7. Moore, L. A., Sykes, J. F. *Amer. J. Physiol.* 1941, **134**, 436.
8. Woollam, D. H. M., Millen, J. W. *Brit. J. Nutr.* 1956, **10**, 355.

change between birth and the age of 150 days; but in thirty-five chicks hatched normally, and subsequently fed on a diet deficient in vitamin A, there was a progressive rise in pressure from an average of 108 mm. of water at the age of 30 days to an average of 212 mm. water at 125 days. A third group of chicks were obtained from hens which had been deprived of vitamin A; after hatching, these chicks were fed on a diet deficient in vitamin A; their C.S.F. pressures rose at the same rate as those of the second group, though the mean pressure was higher at a given age in this third group than in the second. It was apparent that the pressure was related to the total (pre- and post-natal) time on a diet deficient in vitamin A rather than to the age of the chicks. At necropsy no bony abnormality was found in any of these chicks, and clinically the vitamin-deficient were indistinguishable from the normal controls. Colloidal carbon was injected into the lateral ventricles of three vitamin-deficient chicks, and at necropsy it was found to have passed freely through to the ventricular system, and to be distributed around the meningeal cuffs of the spinal nerves. The ventricles were not dilated in any of them; but Woollam and Millen point out that the choroid plexuses of birds, unlike those of higher animals extend out into the general subarachnoid space, and internal hydrocephalus would hardly be expected. They still believe that the over-production of C.S.F. is the cause of the increased pressure; but on the evidence this cannot be regarded as proven.

These observations raise important questions. Hydrocephalus has occasionally been reported in infants born to mothers deficient in vitamin A.[9] In this country it is unlikely that pregnant women will be deficient in this vitamin; but if the experimental findings are applicable to man, the hazards of such deficiency may rank with those of rubella. Clearly this possibility must be considered in all cases of fœtal abnormality.

EMMETROPIA AND AMETROPIA

THE impression that elongated eyes are myopic and short eyes hypermetropic is largely correct; but the mechanistic corollary—that all emmetropic eyes are of the same length and dioptric power—is far from correct. The first breakdown of the concept of fixed optical components in the eye resulted from work by Schnabel and Herrnheiser,[10] who found a range of from 22·0 to 25·0 mm. in the axes of 23 enucleated emmetropic eyes. Studies by later workers on the other components of refraction—namely, corneal power, lens power, and anterior chamber depth—also showed a range of variation. Before the advent of the modern concept of biological variation it must have been difficult to reconcile such variation with the accuracy of structure required in the emmetropic eye; but one by one the frequency-distribution curves of the components of refraction were shown to conform to a normal curve.

At first the interpretation of such findings was that emmetropia and the refractive errors resulted from the chance association of the components of refraction.[11] This, however, was not quite true; for the distribution of emmetropia and the refractive errors in the population does not fit a normal curve, there being an undue proportion of emmetropia and nearly emmetropic refractions.[12 13] This departure from normal distribution denotes that, though each of the components of refraction shows a normal distribution, they cannot be freely variable; some correlating influence must organise them so that there is a tendency greater than chance to produce emmetropia.

Prof. Arnold Sorsby and his colleagues[14] have confirmed the normal distribution of the values of axial length, corneal power, lens power, and anterior-chamber depth. They have also confirmed that there are more emmetropes and near-emmetropes in the population than can be accounted for by the free association of the optical components of the eye. Their measurements of the optical components show that "a wide range of axial lengths, corneal powers, and lens powers is seen in emmetropia, the respective values being 21 to 26 mm., 38 to 48 D., and 17 to 26 D." They conclude therefore that "the emmetropic eye is not the end-result of a haphazard combination of variable components, but a coördinated organ. The individual emmetropic eye, like the excess of emmetropes in the general population, is not accidental." They also show that the values of the optical components which occur in emmetropia also occur in ametropia up to ±4·0 D., but eyes with refractive errors greater than ±4·0 D. show values of refraction components (especially axial length) greater than those which occur in emmetropia. An important qualitative difference is thus shown between ametropias less than and greater than 4·0 D., the former being due to incoördination of optical components within the emmetropic range and the latter being due to components beyond the emmetropic range for which no coördination during growth could have compensated.

Sorsby and his co-workers studied the correlations of the optical components and found that the correlation coefficient between axial length and corneal power in emmetropic eyes is as high as −0·877 but with increasing ametropia up to ±4·0 D. the correlation becomes progressively poorer. Thus in emmetropia the correlation makes it clear that longer eyes tend to have "flatter" corneæ and shorter eyes more "curved" corneæ, while in the refractive errors up to ±4·0 D. corneal and axial length are less well adjusted to each other—facts acceptable to anyone with a knowledge of simple optics. From these findings and from previous work on corneal refraction and axial length in the developing rabbit eye[15] it is postulated that a "simple mechanical and self-regulating process would appear to underlie the marked correlation between axial length and corneal power." The axial length of the eye in the newborn averages about 16 mm., whereas the full-grown eye is about 24 mm. long. An increase of 8 mm. in axial length demands a decrease of refractive power of some 20–30 D. if the eye is not to become excessively myopic. It is not clear yet how the exact adjustment to increased axial length is achieved, but clearly the simple mechanical effect of increasing the spherical size of the eye must automatically lessen the refraction of the cornea by flattening it. The lens also must play a part in the adjustment and Sorsby's team have shown a correlation (−0·488) of lens power with axial length. This correlation differs from that of cornea to axial length in that it applies equally in emmetropia and in the ametropias up to ±4·0 D. It signifies that, irrespective of refractive error, there is a tendency for long eyes to carry "flattened" lenses and short eyes more "curved" lenses. Probably the increasing pull on the zonule as the eye enlarges during growth provides a simple mechanical adjustment.

Diminishing corneal and lens curvatures are the two main mechanisms by which the ocular refraction is adjusted to the increasing axial length during normal growth. It has been shown that each of these mechanisms can be accounted for mechanically by the increasing size

9. Cornfeld, D., Cooke, R. E. *Pediatrics*, 1952, **10**, 33.
10. Schnabel, I., Herrnheiser, I. *Z. Heilk.* 1895, **16**, 1.
11. Steiger, A. Die Entstehung der sphärischen Refraktionen des menschlichen Auges. Berlin, 1913.
12. Brown, E. V., Kronfeld, P. C. *Ophthal. Congr.* 1929, **1**, 87.
13. Strömberg, E. *Acta ophthal. Kbh.* 1936, **14**, 281.
14. Sorsby, A., Benjamin, B., Davey, J. B., Sheridan, M., Tanner, J. M. Emmetropia and its Aberrations. *Spec. Rep. Ser. med. Res. Coun., Lond.* 1957, no. 293. H.M. Stationery Office. Pp. 69. 7*s.* 6*d.*
15. Sorsby, A., Sheridan, M. *Brit. J. Ophthal.* 1953, **37**, 555.

of the eye during growth. It is unlikely, however, that a mechanical process can be entirely responsible for the exactness of adjustment required. Sorsby and his team put forward the interesting hypothesis that, just as the optic vesicle is the "organiser" of the overlying ectoderm into a lens and the overlying mesoderm into sclera and cornea, so the retina (derived from the optic vesicle) may well determine the scleral, lens, and corneal sizes. A small retina will have a small overlying sclera, with, therefore, a small curved cornea and a highly curved lens. A large retina will be covered by a large sclera, and the cornea therefore must be large and flattened and the lens of large diameter and flattened. An emmetropic eye is thus conceived as the result of an orderly adjustment which takes place during growth and which is initiated by the optic vesicle and maintained by the retina.

Further understanding of the nature of the refractive errors, and especially of high myopia, depends on elucidation of the hereditary transmission of the optical components of the eye. The manner of growth of the eye also requires investigation. The valuable report by Sorsby and his team includes accounts of preliminary studies on both these questions.

PANCREATITIS AND CORTISONE

ACUTE pancreatitis is usually a non-infective autolytic process precipitated by the release of activated enzymes into the interstitial tissue of the gland. The extent and severity of the autolysis seems to determine whether hæmorrhagic necrosis or merely œdema ensues. Normally pancreatic enzymes are detectable in the plasma—which suggests that a small amount of the acinar secretion is endocrine and enters the blood-stream direct, although by far the greater part is exocrine and flows into the small intestine. What upsets this relationship and initiates pancreatitis remains a mystery. Experimentally pancreatitis can be produced in several ways [1]—by rupture of the acini with injections under pressure down the duct, by blockage of the duct and stimulation of secretion, by damage to the pancreatic blood-supply and impairment of local nutrition, and by administration of ethionine (an analogue and anti-metabolite of the amino-acid, methionine). Clinically acute pancreatitis is usually associated with disease of the biliary tract or with acute alcoholism,[2] but in neither case is the mechanism clear. Pancreatitis also arises in association with scarlet fever, otitis media, diphtheria, typhoid fever, influenza, trauma, and, of course, mumps.[3]

If the diagnosis is sure, medical treatment is directed towards relieving pain, countering shock, correcting electrolyte abnormalities, preventing suppuration, and suppressing pancreatic secretion.[4] The mortality varies from 5 to 30% and is highest in those with severe circulatory collapse. Some patients have recently been treated with cortisone or other corticosteroids,[4–8] to combat the shock and suppress the inflammatory reaction. The shock has been ascribed to adrenal exhaustion, and also to proximity of the pancreas to the adrenals causing adrenal involvement and hence adrenal insufficiency.[9] There is no good support for these views, although one of Bockus's seventy-eight patients was found at necropsy to have adrenal atrophy.[2] Whatever may be their action, cortisone by mouth or, when there is urgency, hydrocortisone intravenously seem to be of value, and several workers claim life-saving results in severely shocked patients.[4 7]

In papers which appear on earlier pages of this issue Dr. Baar and Dr. Wolff describe two cases, and Dr. Marczynska-Robowska describes a third case, of children in whom acute pancreatitis developed while they were having cortisone or corticotrophin; and the question arises what part, if any, these hormones played in its causation. In a girl with asthma, the administration of 25 mg. of cortisone was followed at once by pancreatitis, and she died within five and a half hours. The other two patients had conditions which could well have been ætiologically significant—one had extensive dermatomyositis and the other had Still's disease, pneumonia, and smallpox. Pancreatic lesions can be produced in rabbits by cortisone [10]; but pancreatitis has not previously been described as a complication of cortisone therapy in man, and there seems at present to be insufficient reason for discontinuing the assessment of cortisone treatment in acute pancreatitis provided antibiotics are given concurrently.

TONSILLECTOMY

IN the war against tonsillectomy the conservatives have so far made all the running.[11] The surgeons have remained silent, even though, as Fry [12] points out, over 200,000 such operations are performed annually in the United Kingdom. Crooks [13] has now written, with skill and ingenuity, in defence of the operation; and representing, as he does, the Great Ormond Street school, he deserves close attention.

He has selected for evaluation a series of 50 doctors' children whose tonsils and adenoids he removed over a period of ten years. In the follow-up, he says, a skilled observer—the doctor-parent—has been constantly present to assess the result. (Skilled, certainly; but hardly unbiased or dispassionate.) The results are presented under headings of the symptoms before operation and the effect on them of tonsillectomy. Thus, of 42 children who previously had had tonsillitis and inflamed throat, 20 were pronounced cured, 19 improved, and 3 unchanged. For all cases and symptoms, 48% were judged cured, 42% improved, and 10% unchanged or aggravated. These figures may seem encouraging; but there was no control series, and it is fairly well known that introduction of controls shows that the operation makes no impressive difference.[14] Nor does Crooks say how many doctors' children he declined to operate on during the same decade.

THE REFUGEES

ALTOGETHER £517 was made available to the fund for medical refugees from Hungary which we opened at the end of last year. Nearly all this money was divided between thirty doctors for such expenses as clothes, journeys, and accommodation; but a small sum was devoted to the cost of dictionaries and of gramophone records giving elementary instruction in English. In addition, temporary homes were found for several doctors and their families with readers who had offered such help. Our Hungarian colleagues expressed warm thanks for this first-aid, reaching them as it did before they had begun to find their feet in Britain.

ACCORDING to the Civil Tables of the *Registrar-General's Statistical Review* the estimated population of England and Wales for 1955 was 44,623,000.

1. Grossman, M. I. *Arch. intern. Med.* 1955, **96**, 298.
2. Bockus, H. L., Kalser, M. H., Roth, J. L. A., Bogoch, A. L., Stein, G. *Ibid*, p. 308.
3. Gibson, J. M., Gibson, J. M. jun. *J. Pediat.* 1956, **48**, 486.
4. Jones, C. A. *Arch. intern. Med.* 1955, **96**, 332.
5. Stephenson, H. E., Pfeffer, R. B., Saypol, G. M. *Arch. Surg.* 1952, **65**, 307.
6. Eskwith, I. S., Cacace, V. A., Sollosy, A. *New Engl. J. Med.* 1955, **252**, 494.
7. Rogers, N. C., Wilson, A. O., Meynell, M. J., Cooke, W. T. *Lancet*, 1956, ii, 651.
8. Brockis, J. G., Jones, E. T. *Brit. med. J.* 1956, ii, 1524.
9. Jacobs, A. *Lancet*, 1956, ii, 733.
10. Stumpf, H. H., Wilens, S. L., Somoza, C. *Lab. Invest.* 1956, **5**, 224.
11. See *Lancet*, 1954, i, 208.
12. Fry, J. *Brit. med. J.* Jan. 19, 1957, p. 124.
13. Crooks, J. *Practitioner*, 1957, **178**, 215.
14. McCorkle, L. P., Hodges, R. G., Badger, G. F., Dingle, J. H., Jordan, W. S. *New Engl. J. Med.* 1955, **252**, 1066; see *Lancet*, 1955, ii, 810.

Special Articles

THE RESPONSE OF MALIGNANT TUMOURS TO RADIATION

A HYPOTHESIS

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THE only known agent which has any destructive effect on the growth of malignant tumours (apart from the metastases of carcinoma of the prostate) is radiation from radium or from an X-ray tube. Although this action has been known for upwards of fifty years we are still completely ignorant of the manner in which it acts. During all this time attention has been directed almost exclusively to working out appropriate dosage and methods of getting rays of the proper intensity at the site of the growth without damaging neighbouring tissues. Because, in tissue-culture, X rays have been proved to kill malignant cells before normal cells, it has been accepted that all we have to aim at, to bring about a cure, is to get rays to the growth in sufficient intensity. For which reason the aid of physicists is regularly called in to calculate the correct dose and to give guidance as to how the rays should be directed to the desired spot. The surgeon, who has been instructed where he must put his radium needles to be effective is not likely, in the event, to get them near the sites recommended by the physicist. Nor is there such exactitude in the biological reactions as rules in the world of the physicist.

Clinical experience with radium needles has clearly demonstrated that the most important area in which to put the radium is in the healthy tissue round the growth. In the tongue the needles are placed as a palisade around the tumour. How strange this is if the greater intensity of the rays is required for the malignant cells. It is true that, if the tumour is at the centre of a sphere of radiating needles, it gets more radiation than the zone in which the needles lie. Since the less radiation the normal tissues get the better, it seems very odd that the needles are not confined to the region of the malignant cells where they are needed. Why is this other method, harmful to healthy tissue, universally used? For the very good reason that the clinical results are better. But it is possible that radiations do not work in this simple fashion. It is quite as sensible to believe that the radiation, acting on normal cells, alters their metabolism so that they produce substances which are antagonistic to the agent which causes cancer (in all probability a virus), or to the cells which have been altered by the cancer agent, and that these substances, being carried by the lymph stream to the area of the growth cause death of cancer cells. If such substances are produced they would seem to be destroyed before they reach the general circulation, because the irradiation of a tumour has no effect upon distant metastases.

EVIDENCE FOR CHEMICAL ACTION

Is there any evidence of such chemical action, apart from its being better to implant radiating foci outside the tumour in healthy tissue? In this connection an observation made by Geoffrey Keynes,[1] when he was carrying out his work on the treatment of carcinoma of the breast by the implantation of radium needles, is enlightening. Keynes's method was to implant radium needles in the breast tissue all round the tumour, but not actually into the growth itself. It was necessary, in this pioneer work, to prove that the tumour treated was in fact a carcinoma, and to do this Keynes excised a small piece for histological examination. In the report of his cases he says he gave up this practice because he found that, although the primary tumour disappeared, carcinoma was apt to grow afterwards in the scar resulting from his biopsy. This is a very curious fact. The pieces of growth removed for examination were taken at the time of the removal of the needles—7–10 days after their insertion. The cells of the growth left behind in its original situation were alive at this time but subsequently died. The cells which were transplanted to the skin lived. Both sets of cells had been subjected to the same dose of radiation. And it does not seem that interference with the blood-supply of the tumour by radiation could afford an explanation; for although, as is well known, some damage does occur it could not conceivably be as great as in a completely separated graft. The transplanted irradiated cells had so much vigour in them that they survived the period of formation of a new circulation and then grew rampantly.

Let us look at this matter a little closer. The breast is an organ which, as far as its lymphatic drainage is concerned, is quite free from the subcutaneous fat in which it lies. The lymphatics form a plexus round the alveoli of each of the 15–20 segments of which the breast is composed, and from this plexus the lymph collects into ducts which drain into the subareolar plexus from which two large lymphatic vessels run to the axillary glands. That some minor vessels run to the anterior mediastinal glands and to above the clavicle does not alter the fact that, if the lymphatics of the breast are injected with methylene-blue, none of the dye runs into the subcutaneous tissue in which the breast lies.

Now Keynes implanted his radium needles in normal breast tissue. Any chemical products formed as a result of this stimulation would be carried off by the lymphatics of the breast and necessarily bathe the tumour tissue. Let us assume that these chemical agents effect the destruction of the growth, not instantaneously but over some unknown period after withdrawal of the needles. If Keynes, by his biopsy, implanted malignant cells into the skin he would be carrying them away from the healing stream he created by his radium implantation, as none of the lymph of the breast passes through the skin. The cells, not having been killed by the direct impact of the rays, would be free to grow in their new situation.

This observation by Keynes (which he did not comment upon except to say that he abandoned biopsies because of it) would be explainable if cancer is cured by X rays as the result of a response of normal tissues to radiation. It is at least a possibility to which attention might be fruitfully turned.

Further support for this view would seem to be afforded by the frequent failure of a second dose of X rays when a recurrence has taken place at a site previously subjected to radiation. The normal tissues here have been damaged so that they are unable to respond to radiation, while the new vigorous cancer cells grow unaffected.

Little is known of the chemical effects upon the tissues of exposure to X rays, and it is most remarkable that intensive research has not been undertaken on this aspect of cancer treatment. There would be much to explain if we accept this chemical hypothesis. Why, for instance, is there no general action of the drug? There can be several explanations of this: it may, for instance, be produced in very small quantities and quickly diluted or destroyed in the blood-stream. But the absence of distant action should not hinder us from a chemical investigation of what takes place at the irradiated site, and knowledge gained of this may point the way to the attack on metastases. That a local store is set up from which the substance is slowly released is indicated by the fact that the destructive process of the cancer goes on after the cessation of the radiation.

1. Keynes, G. *Brit. J. Surg.* 1932, **19**, 415.

SUGGESTED RESEARCH

The testing of thousands of drugs has been without result. Here there is something happening, here are tumours actually disappearing, in certain circumstances melting away before our eyes. An investigation of what is taking place would surely be more likely to give results than the random testing of drugs or intensifying our efforts to get shorter and shorter waves in narrower and narrower areas—a line of research which has been singularly unproductive over many years.

In planning such researches several considerations come to the fore. Because of the element of time it is obviously best to work with implanted tumours in small laboratory animals, and it must be ascertained first whether the particular tumour we choose for experiment can be caused to disappear by exposure to X rays. Then a tumour must be selected that will give as near as possible 100% positive results on transplantation. No deductions could be depended upon with tumours showing great biological variations. This is one of the difficulties hampering such work.

The chemical extracts of tissue can be prepared by using lipid solvents in some cases and aqueous in others. Heterologous extracts of this kind can be quite harmless on injection if protein be removed. But by eliminating proteins we may be discarding the very agents we are looking for. Then we are quite ignorant as to whether the wanted substance is thermolabile—another severe handicap to technique and the maintenance of sterility. The particular tissue which should be extracted may be of great importance, so various tissues will have to be tested.

The method of radiation needs much consideration, for the quantity of energy needed to produce chemical changes such as we want is quite unknown. If a β-radiator be used the problem of getting the whole volume of substance under the influence of the electrons must be solved.

Such are the questions for which answers have been sought in some researches by Dr. Arthur Compton and myself. But the whole problem is a very large one, and I do not see, apart from the unlikely lucky hit, that an early solution can be arrived at unless such researches are undertaken on a considerable scale and by numerous experimenters. To me it seems well worth pursuing any new path in the baffling enigma of cancer.

PRICE OF PROPRIETARY PREPARATIONS

THE Government have accepted in principle a scheme for regulating the price of the 4000 proprietary preparations which the Joint Committee on Prescribing recommended should be available for National Health Service patients subject to satisfactory price arrangements with the manufacturers. These drugs account for about 90% of the cost of all proprietaries prescribed under the health service—£23½ million out of a total of £25½ million. The scheme has been negotiated by the Health Ministries and the Association of British Pharmaceutical Industry. It will run for a trial period of three years.

Under the scheme manufacturers will regulate their prices voluntarily according to the following principles:

The price in the United Kingdom will not exceed that which the product commands in adequate volume in overseas markets in face of international competition.

When a product is not exported in significant quantity, if an identical non-proprietary standard drug is available in the U.K. the price of the proprietary shall not exceed the price of the standard drug.

If it is impossible to apply either of the above provisions, a maximum price may be determined by using a detailed formula comprising (i) an ingredient allowance based on recognised trade prices and (ii) processing and packaging allowances according to a schedule covering different types of product.

The prices determined by these principles will be maximum prices. Immediate effect will be given to price reductions that result from the application of the scheme; but if the permitted maximum is higher than the existing price the existing price will not be increased on that account. The scheme also provides that a manufacturer may instead negotiate "a fair and reasonable price" with the Health Departments.

The scheme is not designed to reduce prices generally but to curb excesses where they exist. While its effect on National Health Service costs is not expected to be large, a saving of up to £750,000 a year is thought possible. To meet the industry's need to finance research and development no product will come under the scheme during the first three years of the product's life.

THE ROYAL COMMISSION

Terms of Reference and Procedure

AT a special comitia of the Royal College of Physicians of London on April 11, Sir Russell Brain, the president, read the answers he had received to questions he had asked the Prime Minister. He also gave an account of his meetings with the Royal Commission and with its chairman, Sir Harry Pilkington. After hearing his statement the college decided that they wished to coöperate with the Royal Commission.

The Prime Minister's Answers

Question 1

In clause "A" of the Royal Commission's terms of reference the term "other professions" is a vague one, since today there is no agreed definition of a profession. Apart from this it is difficult to see why the incomes of other callings should be treated as irrelevant to the economic and social status of the professions. Will the Royal Commission be free to take into account incomes earned not only in the "professions," but also in commerce and industry, both as salaries and wages—a point of obvious importance in relation to recruitment to medicine?

Answer.—It must be left to the commission to decide what interpretation should be put on the words "other professions," but I feel sure that they would not wish to adopt any narrow interpretation or refuse to consider any callings which might be cited in evidence before them.

Question 2

Clause "B" begins: "What, in the light of the foregoing, should be the proper current levels of remuneration?" This has been interpreted as meaning that the Royal Commission would have to limit itself to a consideration of the matters set out in clause "A." The fear has been expressed that this is unduly restrictive, and that the Royal Commission having heard evidence on other matters would find that its terms of reference precluded its consideration. I have in mind the matters referred to the Spens Committees, namely, "the desirability of maintaining in the future the proper social and economic status" of general medical practice and consultant and specialist practice, and their "power to attract a suitable type of recruit to the profession." Hours of work and the responsibility of the work undertaken are also important considerations. Would the Royal Commission be free to make recommendations "in the light" not only of clause "A" but also of any other evidence which the medical and dental professions might wish to present?

Answer.—The medical profession would be free to bring points of this kind to the notice of the commission, and there is nothing in the terms of reference to prevent the commission from considering them. Indeed, in order to satisfy their terms of reference they would have to consider some at any rate of them. As in the case of other evidence it would be for the commission to decide what weight to attach to them.

Question 3

It would seem that any recommendations about future remuneration should take into account how the present levels of remuneration have been arrived at, and this would include a discussion of the recommendations of the Spens Committees and the Danckwerts award. Would the doctors and dentists be free to put before the commission their view that the remuneration of the

professions, now and in future, should be determined on the basis of the Spens recommendations and the Danckwerts award?

Answer.—I feel sure that the commission will be prepared to receive and to take into consideration any expression of views which the medical and dental professions put before them as being in their opinion relevant to the commission's work.

Question 4

On March 11 in the House of Commons, Mrs. Jeger asked the Minister of Health "whether it will be within the terms of reference of the Royal Commission on doctors' and dentists' remuneration to consider the abolition of merit awards." The Minister replied: "The Royal Commission will normally be concerned with levels of remuneration, not with methods as such. Whether or not questions such as that referred to by the honourable member are within its terms of reference must rest with the commission itself to decide." I should be glad to know whether the commission has reached a decision on this point, and, if not, when it will have done so.

Answer.—I cannot say what if anything the commission have decided; if it becomes possible for them to make any statement on the matter which you raise, they will no doubt do so themselves. But I imagine that they would wish to hear evidence and to make substantial progress with their work before arriving at a view as to whether, and if so how far, their main task of recommending "proper current levels of remuneration" requires them to consider the particular matter which you mention.

Question 5

There is a strong feeling in the medical profession that our colleagues in the public-health service should not be excluded from the scope of any review of remuneration. Do the terms of reference of the Royal Commission include them?

Answer.—The remuneration of doctors employed by local authorities is excluded from the scope of the Royal Commission's recommendations, but any claim on their behalf through the usual machinery would necessarily be considered in the knowledge of any recommendations of the commission.

Having begun his letter by saying that "interpretation of the terms of reference is a matter for the Royal Commission and I cannot in any way formally commit it," Mr. Macmillan concludes with the statement that he has consulted Sir Harry Pilkington, who agrees with his replies.

Statement by the Royal Commission

On April 12 the Royal Commission issued a statement on how they have decided to proceed.

1. The Spens reports and the Danckwerts award will be studied by the commission, and also the reports of any other commissions and committees in so far as they are relevant to the circumstances of the medical and dental professions and to the relationship of those professions to the community as a whole.

2. The commission will bear in mind the need for maintaining a proper level of recruitment to the medical and dental professions in competition with other callings, and will consider evidence as to conditions imposed by the nature of the work.

3. The phrase "other professions" will be interpreted widely so as not to exclude, for example, science and other graduates in industry at all levels.

4. The commission are not asked to recommend remuneration for doctors and dentists employed by local authorities; but these doctors and dentists are among the "other members of the medical and dental professions" on whose remuneration evidence will be received for purposes of comparison.

5. "Other connected occupations" cover a wide range of persons, including on the one hand hospital administrators, and on the other, nurses and medical auxiliaries, whose remuneration will be considered with special reference to differentials.

6. The commission will in the light of all this and any other relevant evidence recommend such "current levels of remuneration" as appear to the commission to be justified.

7. The commission's duty to recommend current levels of remuneration calls for recommendations covering, for example, average incomes and the desirable spread between extremes; but it does not call for the construction of detailed schemes of distribution.

8. After consideration of the desirable current levels of remuneration for doctors and dentists, the commission will consider whether, and if so what, arrangements should be made to keep that remuneration under review.

In a separate notice the Royal Commission are asking all interested persons or organisations to offer evidence. "Preliminary inquiries have shown that the preparation of this evidence will take some of the bodies concerned considerable time. The commission are anxious to complete their task with the utmost speed consistent with thorough examination of all the relevant issues, and hope that all written evidence and submissions to the commission will be in their hands within the next three months."

Public Health

The Salford Radiography Survey

IN 1953, an intensive mass miniature radiography (M.M.R.) survey was made in Salford,[1] and some of the new points made in a report on it by Hughes[2] will be useful in planning future surveys.

A feature of the survey was a special canvass of a random sample of the population, urging them to attend. The response was 29·5% (i.e., about the same as in the general population of adult Salford residents) when a commercial firm of canvassers was used, but 42·7% when the canvassing was done by health visitors, who more often elicited a family history of tuberculosis. The health visitors could not be spared for further canvassing from their other duties—one of the most important being to supervise tuberculous patients in their homes.

Persons in the random sample were asked various questions. Most preferred evening M.M.R. sessions, and thought that leaflets (which were sent to all householders) were the most effective form of publicity. But Dr. Burn, the medical officer of health, was impressed rather by the value of personal interviews. Attendances for radiography were greatest in the early weeks of the campaign: enthusiasm fades after six weeks. When the numbers began to fall off, professional canvassers were used to rekindle it, but the response was slight. In general the response was regarded as disappointing, and this was thought to be due to the many previous selective surveys in the city.

As usual in mass radiography, the highest prevalence of tuberculosis was found in patients specially referred by the family doctor, and a substantial number of tumours was also detected. The group with the highest prevalence of tuberculosis was men of 45–59—in which the response was poor. In various surveys it has been found that the bigger the proportion of the population responding, the higher the number (per 1000 radiographed) found to have active disease. It is estimated that there may be 150–160 undetected cases in Salford, more than half of them with positive sputum.

As a result of the survey, there was a peak in the incidence of new cases found in Salford in 1953; since then the number has fallen sharply, and it is now below the average for the 21 largest towns of England and Wales. As in the country as a whole, about 21% of deaths from respiratory tuberculosis in Salford in 1955 were in cases not previously notified. The number on the clinic registers is rising by 2–3% a year, though the death-rate continues to fall. The record of patients recovered and erased from the register is said to be better than in most towns.

A list of priorities for the most efficient use of M.M.R. is given by Dr. Burn.

1. See *Lancet*, 1954, ii, 1172.
2. Hughes, H. F. The Salford Health Survey: Review of the Mass Radiography Survey in 1953 and the position to 1956. Obtainable from the Public Health Department, 143, Regent Road, Salford, 5.

Medical Education

THE STUDENT AND SEX EDUCATION

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THE student and his problems are sometimes discussed as though he were a separate species of mankind created de novo, already 17 years old! It seems to be forgotten that he is an adolescent, very recently a child, who often has just left the security of the parental home for the first time. He is in fact especially likely to have emotional problems, since he commonly combines high intellectual equipment with inadequate emotional development, compared with the average adolescent in commerce or industry whose emotional adjustments are usually made earlier (Grant 1954, Logan 1954).

He is equally likely to have problems of sex. The combination of emancipation from parental authority, a fevered romanticism, and an urge for erotic adventure may well throw his emotional stability out of gear. In the case of medical students, the study of anatomy and physiology induce a mechanistic approach to matters which are primarily spiritual and psychological. The student whose sex education has been inhibited or distorted by his home background can get into very considerable difficulties, for he may already have serious emotional tensions when he arrives at the university. Parnell (1951) found that 1% of all undergraduates at Oxford were suffering from some mental disturbance, and of all those absent through illness for a full term over half were mentally ill. Malleson (1954) said that 10% of all students in residence in any given year could be classified as "distressed students," and that the suicide-rate was higher than in a similar age-group in the general community. Hence we cannot discuss sex education for the student without reference to the formative influences in his life before he reaches the university. Sex education does not begin with the formal talk by father to son as pictured in Victorian times. It starts at a very early age by unconscious absorption of the attitudes adopted by those handling the child, and it continues throughout life. It is much more than a description of the genitalia and the sex act: it includes the whole relationship of man and woman with each other. Thus the student may enter medical school with only the vaguest idea of how to deal with manifest problems of sex and marriage which are so important to the welfare of so many patients; and of course he is still less likely to recognise these problems when they are concealed as symptoms to which his teaching has paid no attention.

It is strange therefore that though every student during his training is expected to know how a gastrectomy and an arteriogram are done—operations which none will ever have to perform without further postgraduate training—sex and marriage are touched on only briefly as an incident in clinical teaching. His instruction is still too often based on organ dysfunction rather than on the treatment of the patient as a whole; and where the two patients comprise the single entity of a marriage, such an approach is even more hopeless. As a rule, the illness encountered in a clinic is seen from the viewpoint of the specific organs in which that clinic specialises rather than as a syndrome of the whole person. The consequence is that most doctors who acquire any knowledge of sex by the time they graduate, do so, not by organised instruction in the subject but rather by personal enterprise. Not all doctors may be suited temperamentally for giving advice on this subject; but at least they should receive sufficient basic training to enable them to recognise not only their patient's difficulties but also their own inhibitions.

In an infertility clinic such as mine, where husbands and wives are seen together, and where an attempt is made to assess the marriage rather than one partner of it, many cases (which are referred apparently solely for sterility) are in fact found to have psychodynamic problems of marital disharmony which have unfortunately not been recognised either by the patient or the doctor. Worse still, advice has been disastrous in certain cases when given by a doctor insensitive to, or untrained in, the recognition of these emotional problems. This consideration led me to inquire whether medical education is adequate in these matters.

Instruction at Medical Schools

To ascertain the present position of medical teaching I asked forty-seven medical schools in Great Britain and abroad to tell me what instruction is given in the following subjects:

1. The physical and psychological background of normal coitus and conception.
2. Contraception.
3. Sexual maladjustment and marital dysharmony.

Thirty-six schools sent replies—twenty-four in Britain and twelve abroad. Of these, only two said that no instruction was given at all, one saying that it "was not desirable for students." But only five provided formal lectures on coitus and conception, though in a further six these topics were discussed in clinics. In twelve, one formal lecture was given on contraception, and in another seven clinical instruction was arranged. In seven, lectures were given on sexual maladjustment and in another five it was discussed in the clinics. Finally, the psychological problems of the background to marriage were discussed by none in formal lectures, but in fourteen these were mentioned in a general way during the course of clinical teaching. These figures suggest that probably less than half of the students at these schools have had anything like adequate instruction before they enter their professional life.

To compare the opinions of the students with those of their teachers, inquiry was made of graduates from five universities who had qualified in 1951–53. The teachers at these particular universities had informed me that such instruction was included in general clinical teaching, though not in systematic lectures, and they were satisfied that enough was taught. But at only one of the five was the training regarded as satisfactory by the graduates. At the four others, all the graduates said that they were dissatisfied and had in fact very little or no instruction.

We may compare this with the replies given to Ingleby (1952) on the teaching of teachers and clergy, who also have an influence on family life in the community.

Teachers

Of fifty-one training-colleges and seven university education departments, all except three deal with sex. The courses of instruction were divided by Ingleby into three groups: (1) Fifteen covered only anatomy and physiology and there were no other lectures. (2) Twenty-one discussed the psychological implications and gave training for sex teaching in a broad sense. Possibly this was done with an academic rather than a dynamic psychological approach, but at least an attempt was made to discuss emotional adjustments and sex relationships in terms of the students' own personal adjustments. (3) In ten, attempts were made to give a broader approach to sex in the wider setting of marriage and the family; in some cases this included a completely separate course of lectures.

Clergy

In sixteen out of twenty Church of England colleges, a course of 9–12 lectures with special references to the ethical and psychological aspects of sex and marriage was given. Other denominations gave some training on marriage but none was as adequate as the Church of England training.

From this it seems that doctors are the least equipped of the three professions dealing with these concerns of everyday life. If in fact the main obstacle (apart from inertia) is the overburdened curriculum, surely the time has come to discard some of the traditional items in favour of what is of increasing importance in the modern world.

This is not the place to outline all the psychosomatic syndromes likely to be encountered either in disguise or as diagnoses which the patients themselves make, such as impotence, frigidity, and vaginismus. Such cases should obviously be treated by those who specialise in them; but it is astonishing how many such patients are still treated with tonics, sedatives, or just "reassurance." Once rebuffed they will rarely return to the same doctor for advice on such a matter, and when their difficulties continue for years they eventually become hopelessly incurable.

My purpose is simply to state a case for the improvement of medical education on these topics, and to put forward suggestions for incorporation in the medical curriculum.

Recommendations

The student should receive instruction in sex education and be helped to solve his own personal problems. If he can understand himself, he is better able to understand others: an emotionally maladjusted student will be a bad student and a worse doctor. Each university should have an adviser for students, to whom they can bring their personal problems. He would combine knowledge with understanding based on experience. (An adviser whose advice is academic and who cannot perceive the unasked questions in the student's mind may be worse than no adviser at all. Equally, the other type of adviser who gives the student a slap on the back and the hearty advice to "go out and get a woman" may also do serious emotional damage.) Undoubtedly advisers with the right personal qualifications are scarce, but even so it seems that in many universities little attempt has ever been made to find them. Here the local marriage guidance councils could help.

Systematic lectures on the physiological and psychological background of normal coitus should be given to senior medical students. The relation of sex to the larger sphere of family life and human relations should be explained, and a sense of perspective given of its relation to right living. (At many schools such subjects as marriage guidance, premarital preparation, and marital dysharmonies do not seem to be covered.) Systematic lectures should also be given on sexual maladjustments, coital technique, impotence, vaginismus, &c., by someone experienced in these subjects. Each university library should contain a selection of books and pamphlets on all these subjects.

Instruction in contraception is indicated—both theoretical (with a film) and practical (by attendance at Family Planning Association centres).

Lectures on the spiritual and psychological background to marriage, with special emphasis on normal relationships, could well complete the course.

Lists of suitable books on sex and marriage problems may be had from the National Marriage Guidance Council, 78, Duke Street, London, W.1, or the "Alliance," 238, Edgware Road, London, W.2, free of charge.

I should like to express my thanks to those University teachers who were kind enough to reply to my questionnaire.

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Grant, G. (1954) *Brit. med. J.* ii, 497.
Ingleby, A. H. B. (1952) Bulletin, National Marriage Guidance Council. April.
Logan, R. F. L. (1954) *Lancet*, ii, 409.
Malleson, N. (1954) *Ibid*, i, 824.
Parnell, R. W. (1951) *Ibid*, i, 731.

In England Now

A Running Commentary by Peripatetic Correspondents

IT all started with a seductive brochure from the Central Council for Health Education introducing the first of a series of make-it-yourself pegboard displays to peddle preventive medicine in the market-place. A wave of nostalgia swept over my desk. Far back in school days I turned the odd sixpence carving model *Dreadnoughts*; my undergraduate conception of an embryo in plasticine was an artistic gem, albeit introducing a revolutionary portrayal of the development of the human gut; post-war parental responsibilities saw Sunday afternoon struggles with balsa wood and dope in that era of model aircraft kits. When plastics and puberty brought self-help to the young engineers, I retired from the bench to enjoy presbyopia and the caress of losing consciousness after lunch. So it was a burst of boyish enthusiasm that ordered the pegboard display set. Like all good secretaries, Miss McDour has a depressing flair for pointing out my limitations. Monday morning found her viewing a huge parcel with extreme distaste before she flounced away to submerge herself in the typing pool. The chief clerk's bald head peeped round the door and winked. The office boy came to collect the wrappings, and the caretaker brought elevenses. Our quartet knelt down on the floor to sort out the bits. There were three sheets of instructions, including the old familiar command to have at hand scissors, razor-blades, sharp knives, strong glue, and a knitting needle. The office boy startled me by producing a nicely mounted razor-blade and a flick knife from his pocket. He knew where to borrow a knitting needle; his girl friend on the telephone switchboard is having a race with time to complete her trousseau, but she rallied to our call. The great idea was to produce a three-dimensional effect of a couple of toddlers surrounded by the gin-traps of adult life, symbolised by boxes of matches, dangerous drugs and scheduled poisons, fireplaces and saucepan handles, surmounted by the heart-cry caption "Are they Safe at Home?"

I should never have let the chief clerk use the flick knife. He sliced a chunk out of his thumb and spurted arterial blood all over the saucepan. A tourniquet fixed him, but the model dropped below food-hygiene standards. The office boy got more glue in his hair than on the cardboard; at least it stopped his forelock flopping. By lunch-time we had finished cutting out. I moved my desk over a hole in the carpet. At 2 P.M. we returned to battle. The junior typist, not long graduated from dressing paper dollies, joined the party. She put some cold cream on my hand after we had mounted the matches display and learnt that these new glues are inflammable. Pity about her eyebrows, but she can use a pencil. The chief clerk consoled himself with a couple of aspirins from the poison tray. The caretaker alone emerged unscathed. The job looked very pretty. We creaked ourselves proudly up from the floor at 5 P.M. Miss McDour minced frigidly to my desk with her calculation that our day's labour had cost the corporation well over £10 in salaries, about twice the price of the display set, and just think of a thousand local-government offices frittering away their man-power and knitting needles. But bandaged, burnt, and blistered as we were, we little band of health educators went off rejuvenated to the safety of our homes.

* * *

Recently I met a young couple who had been guests at the Medical Research Council's Common Cold Research Unit at the Harvard Hospital, Salisbury. They were enthusiastic, and said that they would like to pay another visit, taking their ten-year-old child with them. I expressed doubts on the wisdom of this, but later I found my thoughts turning to the possibilities of research in infectious diseases in childhood. What about a Mumps Prophylaxis and Treatment Research Unit for prepubertal males? Parents who had apparently failed to indoctrinate their boys with the mumps virus by close contact with their stricken school-friends, could sign them up for a stay at Fat Face Farm, or Parotitis Place. The major service would, of course, be to induce an attack of mumps in delightful surroundings. Terms would depend on whether the patient stayed only until the onset of his

parotitis, or until the attack was over; in the latter event, there would be a suitable reduction if he consented to act as contact-donor for newcomers. An insurance could be taken out against the rare risk of orchitis at this age. The research would include problems of contagion and tests of possible chemotherapeutic agents, though the number of test-subjects would, of course, have to be dovetailed in with the provision of enough donors. If an isolated virus could be used, the administrative problems would be simplified. Could the Medical Research Council please consider this idea?

* * *

The account of my peripatetic colleague's brush with the Law (March 30) reminded me of a similar occasion which, however, had a happier outcome.

I was bidden to attend at ten of the clock in the forenoon precisely before London's senior metropolitan magistrate—no less. The summons added ominously, wherein fail not. The charge: Unnecessary Obstruction. ("What is necessary obstruction?" a colleague of mine had asked the magistrate some weeks earlier and had promptly been fined double the usual amount.) I was indignant because my car was proximal to the yellow-band notice which guarded the entry of a small tributary into the major artery of traffic. I was even more indignant because I was parked next to a large delivery-van which the policeman told me he would not be prosecuting.

On receiving the summons therefore I rang up the motoring organisation to which I belong. "Leave it all to us," they reassuringly said. "No need for you to attend the court: you will plead guilty of course . . ." They were shocked when I said I had no intention of so doing. A barrister friend of mine was of the same spineless mind. "Don't be an ass," he advised. "I'll represent you if you insist, but it will cost you a lot of money and the old basket will fine you three times as much." I therefore conducted my own defence. When I pleaded not guilty, a sigh compounded of disbelief mingled with pity wandered around the court. The magistrate looked profoundly sad. The atmosphere reminded me of the occasion when the Snark pronounced judgment: "When it said the word *GUILTY* the jury all groaned and some of them fainted away."

The police gave their evidence: I cross-examined. Was I close to a hospital? Yes. Did I ask the constable if he was going to prosecute the delivery van? Yes. Did he do so? No. Why not? It was here that he made his fatal error. "Well, that's different. That chap's delivering goods." "Sir," I said, turning to the magistrate, "I submit that when I go to a hospital I also deliver the goods." The magistrate could be seen wrestling with himself. Hardened inspectors blanched: a passing cloud obscured the sun. Suddenly the Great Man beamed. "Well, well," he observed genially, "I know you doctors have to do your job. Case dismissed."

* * *

First rather senior registrar: Are there any jobs in *The Lancet* today?

Second R.S.R.: No. But there is a rather promising obituary, from Newmanpool.

* * *

News Release, New York (to be used on or after Feb. 10, 1967)

After almost 5 years of intensive research by nearly 1000 company scientists in conjunction with hospital and university researchers the Pillum-Ram Co. today announced 'Multipanas,' an entirely new concept in medication. In one pill it has been found possible to contain all the daily drug needs of the average American. The 'Multipanas Magnatab' consists of an outer core containing 25 vitamins, 25 essential elements, aspirin, a tranquilliser, amphetamine, and bioflavinoids, whilst the delayed-release inner core contains barbiturates. An ingenious label wrapping 3 times round the bottle makes it possible to list each ingredient so as to meet registration requirements. In a companion product for those over 40 this balanced formula has been fortified by synthetic sex hormones with marked anabolic activity. To devise and perfect this product researchers travelled over 600,000 miles. Said the company's President "It is a pity circumstances did not permit them to travel further . . . such products would never have been even thought of 10 years ago." The Pillum-Ram Co. has global branches and subsidiaries including The Pillum-Ram Co. of England.

Letters to the Editor

CÆSAREAN SECTION

SIR,—The picture painted by your leading article (April 6) of maternal and fœtal risks of delivery by cæsarean section is black indeed, and some may feel that the dangers are exaggerated. Crude morbidity figures are difficult to interpret and I have always found it hard to explain the high mortality-rate reported by Marshall and Cox,[1] whom you quote. No practising obstetric surgeon could possibly accept a maternal death-rate of 1% today. In my personal series since 1943 of 1114 sections, 2 mothers have been lost.

In one case a woman semiconscious after eclamptic convulsions died a few hours after delivery. Necropsy showed a pontine hæmorrhage and a large subarachnoid hæmorrhage. In the second case a primipara, exhausted by prolonged labour with an impacted breech presentation, died unexpectedly on the eighth day of the puerperium. Necropsy showed a large pulmonary embolus, with extensive thrombosis of all pelvic veins, extending into the femorals. In the first case, and perhaps also in the second, the operative delivery had little direct relation with the maternal death.

I cannot believe that this experience is exceptional. A similar criticism can be made of your quotation of a perinatal fœtal mortality-rate of 4·9% in Brooklyn. I have not read Gordon's article [2] yet, but we may suppose that a high proportion of these infants were small premature or otherwise prejudiced in some way. Healthy mature infants should not be lost.

It is easy to make further comments on controversial points in the operative technique you recommend. Delivery of the fœtal head by the hand implies a uterine incision large enough to accommodate both hand and head at the same time. It may be difficult to get the fingers below an impacted head and the uterine muscle is easily torn. Some may feel that these are serious drawbacks, and that delivery by small Wrigley's forceps is more elegant and technically more sound. Trendelenburg tilt of the table is permissible only if the patient is properly intubated with a cuffed tube. Otherwise dangerous regurgitation of gastric contents may follow. Ischæmic necrosis of the uterine muscle with continuous sutures is difficult to prove. I have myself been well satisfied with continuous sutures. On four occasions when I have been able to recover the uterus in later years, after a previous section, careful microscopic examination has failed to demonstrate any uterine scar. It is necessary, however, to pay special attention to the strong fascia over the muscle, in order to obtain a perfect scar.

Chobham, Surrey. L. G. HIGGINS.

BENIGN MYALGIC ENCEPHALOMYELITIS

SIR,—The title of the paper by Dr. Galpine and Dr. Brady (April 13) and other reports [3] suggest that the term "benign myalgic encephalomyelitis" may find a place in medical terminology. This name was first suggested in your leader last year [4] for a widespread epidemic disorder of presumed infective origin with the following clinical characteristics: (1) symptoms and signs of damage to the brain and spinal cord in greater or lesser degree; (2) protracted muscle pain with paresis and cramp; (3) emotional disturbances in convalescence; (4) normal cerebrospinal fluid; (5) involvement, in some variants, of the reticuloendothelial system; (6) a protracted course, with relapses in severe cases; and (7) a relatively benign outcome.

1. Marshall, C. M., Cox, L. W. Transactions of the 12th British Congress of Obstetrics and Gynæcology, 1949; p. 30.
2. Gordon, C. A. *Amer. J. Obstet. Gynec.* 1957, **73**, 65.
3. Crowley, N., Nelson, M., Stovin, S. *J. Hyg., Camb.* 1957, **55**, 102.
4. *Lancet*, 1956, i, 789.

With the lapse of time and the publication of accounts of the Royal Free epidemic,[2 5 6] the clinical similarities of the various outbreaks classified in group II of your leader have been underlined, and there seems a prima-facie case that they are similar in cause and pathology.

As Sigurdsson [7] pointed out, there are obvious dangers in naming a disorder in which the ætiology and pathology are unknown. There is always the risk that the name will turn out to be inaccurate. There appear to be two alternatives: (1) the disorder should be named after the place where it first appeared; or (2) a purely descriptive term should be applied on the basis of the known clinical characteristics—"an epidemic disorder characterised by disturbance of the central nervous system, painful muscles, a normal cerebrospinal fluid, and often enlargement of lymph-nodes" (or, to contract, "epidemic ameningitic lymphoreticular myalgic encephalomyelopathy").

The first suggestion has the disadvantage of all eponyms: it conveys nothing to the uninformed. There is also some doubt in this instance which place name to apply. The second, although informative and accurate, is obviously impracticable. Clearly some compromise between accuracy and brevity must be found. "Benign subacute encephalomyelitis" has been suggested.[8] This name has the advantage of conveying that the active course of the disease is often long, but unfortunately it also suggests that the outset is insidious (as in subacute bacterial endocarditis and subacute combined degeneration), which is far from the truth. Crowley et al.[3] have suggested "lymphoreticular encephalomyelopathy"; whatever its other merits may be, this name defies pronunciation and defeats memory.

"Benign myalgic encephalomyelitis" has been criticised because the disease is not always benign, nor invariably myalgic, and possibly never encephalomyelitic. Benignity is relative; and it seems to me that "benign" is sufficiently justified by the fact that there is no other recorded infective disease of the central nervous system without mortality. As various authors [5 9 10] have stressed, the pain in this disease, although not invariably present, may be devastating and is perhaps the feature which impresses itself most forcefully on the observer. As far as the final term is concerned, the clinical impression that the lesion is central rather than peripheral is supported by the electromyogram. There appear, therefore, to be the alternatives "encephalomyelitis," which suggests an inflammatory lesion, or "encephalomyelopathy," which implies a toxic or degenerative lesion. In our present state of ignorance "encephalomyelitis" seems preferable because it conveys the suggestion that the disease is almost certainly infective in origin. As Sigurdsson points out, however, a final decision must await the examination of pathological material, for even in infective conditions some of the lesions may be toxic (as in diphtheria). In the meantime the disorder needs a provisional name and "benign myalgic encephalomyelitis," although necessarily imperfect, has fewest disadvantages.

To reiterate the main points, the following features appear early in the disease and should suggest this diagnosis:

(1) Symptoms and signs of involvement of the brain and spinal cord.

(2) Protracted muscular pain in chest, abdomen, or limbs, often with tenderness, cramp, involuntary movements, spasm, and paresis.

(3) Normal cerebrospinal fluid.

(4) A characteristic electromyogram.

(5) Involvement, in some variants, of the reticuloendothelial system.

Low or absent fever, protracted course, a tendency to relapse, and mental symptoms in convalescence are features of some cases. A curious jerky response of the affected muscles to volition in convalescence may prove to be a further clinical characteristic of this fascinating disorder.

Middlesex Hospital,
London, W.1. E. D. ACHESON.

5. Compston, N. Communication to section of epidemiology, Royal Society of Medicine. Feb. 9, 1957.
6. Richardson, A. T. *Ann. phys. Med.* 1956, **3**, 81.
7. Sigurdsson, B. *Lancet*, 1956, ii, 98.
8. Jelinek, J. E. *Ibid.*, p. 494.
9. Acheson, E. D. *Ibid*, 1954, ii, 1044.
10. Bond, J. O. *Ibid*, 1956, ii, 257.

ÆTIOLOGY OF PRE-ECLAMPSIA

SIR,—An important point in considering Mr. Sophian's views (March 9 and 16) is the question whether, in pregnancy (not necessarily the same conditions as those in Mr. Sophian's experiment when he demonstrated the uterorenal reflex) the growing volume of fœtus and membranes is in reality putting as high a pressure on the walls of the uterus as Mr. Sophian assumes.

Many obstetricians who have had to rupture the membranes of primiparæ who are not in labour have noted the fact that the bag of waters is very often not distended but shrivelled.[1] The same thing has been found in twin pregnancy. The intra-uterine pressure in twin pregnancy is not increased.[1] In acute hydramnios, a high intra-uterine pressure is obviously not primary but secondary to greater secretion of the amniotic fluid or to increased permeability of the vessels in the membranes.

I find it hard to see how the intra-uterine pressure can be high during the whole of pregnancy. The pregnant uterus is not distended by the growing fœtus (as, for example, the finger of a rubber glove may be, by insufflating it and putting the contents under pressure); the muscle cells are multiplying continually, and in this way the walls of the uterus are trying to adapt themselves, by becoming longer, to the growing volume of fœtus and membranes, which are in no way exerting pressure upon the uterine walls.

These walls are not overstretched and the lumina of their arteries not narrowed; the construction of these arteries (curling or corkscrew arteries of Hunter) is an extra safeguard against such events. Hypertension in those arteries has never been demonstrated, but it is often said that, during pregnancy, conditions in them are the same as those under which Goldblatt demonstrated hypertension by applying a clamp to a renal artery. Such assertions, however, are based on the assumption that in pregnancy the intra-uterine pressure is increased; but this assumption is not clearly proven.

In adrenalectomised animals Goldblatt could not produce hypertension by applying a clamp. Even admitting that in toxæmia of pregnancy (e.g., in acute hydramnios) the contents of the uterus may now and then press upon its walls, in the way Mr. Sophian does during his experiments, obviously a situation of stress would be created and the adrenals might play an important part in producing the resulting symptoms—e.g., by producing adrenaline and so constricting the renal cortical arteries. The Trueta phenomenon is often observed after stress.

Mr. Sophian is obviously following Conn when he says that the hormones are playing only a secondary part during toxæmia of pregnancy. But 2 of Conn's 5 patients were Negresses just recovered from severe toxæmia of pregnancy [2]; and Conn's syndrome and aldosteronuria can be provoked in animals by implanting stilbœstrol crystals [3] or injecting growth hormone.[3] For these reasons I am doubtful whether the distinction between primary and secondary aldosteronuria is a justifiable one.

The study of Conn's syndrome, however, has made clear that:

(1) The adrenal cortical hormones have a big influence on glomerular and tubular renal function, causing potassium loss, proteinuria, and sodium retention—symptoms which disappear when a cortical tumour is extirpated.

1. De Snoo and Stroink. Communication to a meeting of the Royal Netherlands Society of Obstetrics and Gynæcology, 1953.
2. Franks, L. M., Chesterman, F. C. *Lancet*, 1956, ii, 1193.
3. Moon, H. D., Koneff, A. A., Li, C. H., Simpson, M. E. *Proc. Soc. exp. Biol., N.Y.* 1956, **93**, 74.

(2) These tumours often contain over 8000 μg. of aldosterone.[4] The quantity of aldosterone found in the urine daily in cases of primary and secondary aldosteronuria is of the order of 30–60 μg: evidently the adrenal cortex is storing most of the aldosterone synthesised there, as the adrenal medulla stores most of the adrenaline and noradrenaline. Only on special occasions is a little part of the store poured into the circulation. Could this reaction be provoked by histamine, liberated after an antigen-antibody reaction?

The study of the urinary excretion of aldosterone, adrenaline, noradrenaline, and the so-called catechol derivates, immediately before, during, or immediately after the eclamptic fits seems to me to be of prime interest for solving the question of the ætiology of toxæmia of pregnancy. Recently Selye expressed the same view.[5] The uterorenal reflex, curious as it may be, is to my opinion not an active factor in the pathogenesis of toxæmia of pregnancy.

Amsterdam, Holland. R. SCHUURMANS.

NEURONE SELECTION IN RELIEF OF PAIN

SIR,—Professor Lehoczky (Feb. 16) refers to the use of 10 ml. of 0·5% aqueous phenol injected into the first or second sacral foramen for sciatica and similar pain from other causes. I have used this approach of Bonica[6] and endorse its value, and would in fact prefer it to intrathecal methods for non-malignant conditions.

Pain from cancer, however, is a different proposition. Here at the Pain Relief Centre we have to afford relief at any level ranging from the highest occipital to the lowest sacral segments. To give some idea of how formidable this is, for cancer in the pelvis alone the segments which must be reached often extend from D11 to S3 or 4. Here, it is essential to eradicate systematically the small non-medullated C fibres from some 11 to 12 roots for unilateral pain, and 15 or more for bilateral pain. This number of roots can be influenced in bulk only by intrathecal injection using 1 ml. phenol (1 in 20 in glycerin) at the D11–12 interspace, followed after five days by a similar 1 ml. injection at the L4–5 interspace for one side. Bonica's approach, though of value at the sacral sciatic site, could never be expected to cover this range of neurones often met in carcinoma. After intrathecal injections, the rapidly acting phenol sometimes cannot penetrate at some of the roots and becomes inactivated, leaving pain residue at the corresponding sites. This resistance is often due to sheltering of neurone cells by areas of carcinoma, as Dr. Shrigley demonstrated for me.

A slower-acting agent, such as phenol and silver nitrate, allowed greater penetration before it was neutralised, and relieved half these resistant cases. If such intrathecal methods were unsuccessful it was considered that the peripheral end of the ganglion might be reached. For this purpose relief has often been completed by epidural injections at the resistant sites. Bonica's method might be defined as epidural injection with the advantage of presenting a bulk of solution to the nerve-roots close to the ganglia. This proximity to the ganglia is essential, otherwise gasserian-ganglion injection would not be required for 5th-nerve pain. Ordinary epidural injections unfortunately tend to follow the diffuse outline shown in the first radiograph in my article (Jan. 5). This has been partly overcome by collapsing the dural sac by puncture at a different level to drain the C.S.F., followed by an epidural injection further down, with the "draining" needle left in situ. The patient lies on the pain-affected side.

I would therefore say that for pelvic carcinoma the neurone elements must be influenced in length—i.e., from D11 to S1 or 2—and in depth, so that the ganglion cells are influenced throughout. Recently I have added Bonica's method in some of my cases, and it has been of great value for providing penetration from the peripheral site in the locality where subarachnoid penetration was insufficient.

Rochdale. R. M. MAHER.

4. Eales, L., Linder, G. C. *Quart. J. Med.* 1956, **25**, 539.
5. Selye, H. *Virchows Arch.* 1956, **329**, 420.
6. Bonica, J. J. The Management of Pain. London, 1953 p. 352.

A STUDY OF WAKE

SIR,—Surely Dr. Jacobides's definition of sleep (March 30) rests on the unwarranted assumption that the starting-point for all thought about sleep-wake is unquestionably and of necessity wake, not sleep. It is this assumption that seems to me to be so wrong. It is like a physiologist trying to study muscle action by assuming that the experiment begins with a contracted muscle, or like an educationist looking at a senior wrangler and wondering how such a person could ever have been in a state of not knowing his twice-times table. It is starting thought from the wrong end.

One is surely justified in seeking an understanding of the problem from as far back in life as possible. It is Barcroft himself who uses the words "asleep" and "wake" in describing fœtal behaviour.

I quite agree with Dr. Jacobides that the concept of "wake maintainers" may not appear convincing at first sight, and it is here that research is most necessary, especially in the earliest manifestations of wake maintenance in young babies. Why does the reticular-activating system sometimes "keep open" for a time after the original arousal stimulus has subsided, especially if the wake-maintainer appears to be a simple, innocuous, and unvarying stimulus?

Perfect sleep is certainly biological "well-being," but this is not to deny that wake may be "better-becoming"!

Hove, 4. W. V. CRUDEN.

INSULIN TREATMENT OF SCHIZOPHRENIA

SIR,—Sacred cows are hardy animals, and the insulin-coma treatment illustrates this too well. It never was any good, but mental-hospital doctors found relief in being high-powered therapists of schizophrenia instead of the mere custodians they once were; so its legendary reputation thrived. There were adverse studies, but they were lost amid an enthusiastic deluge and, for 20 years, the method lived on without a single comprehensive review in the language really to challenge it. Ultimately, when I came to supply one in your columns,[1] the average psychiatrist was seldom any longer aware that strong doubts had always existed about insulin, and in some respectable quarters too.

Heresies are not immediately popular, and the heated correspondence that ensued was largely as expected. There has been no pause in expenditure on new insulin-coma units; they have remained a priority; and even in poor, under-developed countries, experts from Britain still have not hesitated to advise the immense investment they entail.

However, there were signs of a turn in the tide. Whereas only a bare dozen studies questioning, in one way or another, the value of insulin coma appeared over the whole 20 years preceding my review, at least seven have been published since.[2–8] And now, surely, the report by Dr. Ackner and his colleagues (March 23) must at last compel a change in prevailing policies. Here we finally have the most carefully arranged trial on record, and it confirms that the treatment has no specific value, and none, moreover, in the very type of case where its use is particularly recommended.

1. Bourne, H. *Lancet*, 1953, ii, 964.
2. Boardman, R. H., Lomas, J., Markowe, M. *Ibid*, 1956, ii, 487.
3. David, H. P. *Amer. J. Psychiat.* 1954, **110**, 774.
4. De Alarcon Trigueros, R. *Act. luso-esp. Neur.* 1953, **12**, 308.
5. Hoenig, J., Leiberman, D. M., Auerbach, I. *J. Neurol. Psychiat.* 1956, **19**, 130.
6. Keehn, J. D. *J. ment. Sci.* 1955, **101**, 871.
7. Lifschutz, J. E. *Amer. J. Psychiat.* 1954, **111**, 466.
8. West, F. H., Bond, E. D., Shurley, J. T., Meyers, C. D. *Ibid*, 1955, **111**, 583.

The purpose of this letter is to suggest that the continued use of insulin-coma therapy has not only become irrational but is an actual menace to the mentally sick. Being wildly extravagant in the scarcest of mental-hospital commodities—namely, money, and medical and nursing time—it beggars other provision; it has a mortality which is not negligible; and, worst of all, it effectively screens doctor and patient from any other approach to the problems of schizophrenia. The psychiatrist in training probably suffers most damage. Juniors are usually posted in the insulin unit; thus, at its foundations, their knowledge of schizophrenia includes no subtle observation of its psychology and no experience of psychotherapy. Insulin-coma therapy even impedes the proper use of electroconvulsive therapy, which is learnt as a casual procedure, administered sporadically and without system, as an adjuvant to the insulin ritual.

No doubt the insulin treatment will be defended to the death. The "it-can't-do-any-harm-to-try" argument is not only destitute; it is false and dangerous.

University of Otago Medical School, Dunedin, New Zealand. HAROLD BOURNE.

UTERINE ELECTROLYTES IN PREGNANCY AND LABOUR

SIR,—We were most interested to read the account of changes in uterine electrolytes in pregnancy and labour given by Dr. Cort and Dr. Cort (April 6), since we have been working on this and related problems for the past two years. A preliminary note of certain of our findings has already appeared.[1]

It is implied in the Corts' paper that hysterectomy specimens, from women under 46 years of age, represent normal uterus. We feel that this assumption is probably unjustified. To illustrate this point, table I shows a comparison between the electrolyte composition of normal myometrium (biopsies taken at mid-cycle during plastic and other operations on the uterus) and myometrium from uteri which contained fibromyomata. The specimens from fibroid-bearing uteri are divided into two groups—those in which one or more seedling fibroids were present and those in which a hysterectomy had been performed for multiple fibroids. It will be noted that the changes in electrolyte pattern are more extreme in the second group. We have some evidence that these changes are due to hyperœstrinism. Electrolyte disturbance in the uterus appears to occur also in other disorders necessitating hysterectomy. Further, Daniel and Boyes [2] have found some evidence of changes in uterine electrolyte pattern during prolonged bleeding necessitating hysterectomy.

TABLE I—INTRACELLULAR IONS IN HUMAN MYOMETRIUM

—	Normal uterus	Fibromyomata present	
		Seedlings	Multiple fibroids
Intracellular K^+ (m.eq. per 100 g. dry)	28	31	27
Intracellular Na^+ (m.eq. per 100 g. dry)	1	4	6
K^+ concentration (m.eq. per kg. intracellular H_2O)	122	107	90
Na^+ concentration (m.eq. per kg. intracellular H_2O)	9	13	19

Dr. Cort lays some stress on his finding of a progressive loss of potassium from the myometrial cells during normal pregnancy and labour. Our figures do not entirely support this contention (table II). We were unable to detect statistically any actual loss of potassium from the cells as a consequence of pregnancy or normal labour, though the total intracellular potassium levels did fall in inert labour. There was a fall in the calculated concentration of potassium in the intracellular fluid of the myometrial cells during normal pregnancy and labour (table II). This appeared to be due to increased hydration of the cells. Our values for intracellular sodium, which is elevated in pregnancy, are probably comparable to those of the Corts though the actual figures differ because a slightly different assumption was used in determining extracellular space. The values in pregnancy and labour in table II refer to the lower uterine segment, as do those of Dr. Cort. We have, in fact, found parallel changes in biopsies from the upper part of the uterus.

TABLE II—INTRACELLULAR IONS IN HUMAN MYOMETRIUM IN PREGNANCY

—	Normal uterus	Early pregnancy	At term		Delay in labour	
			Not in labour	In labour	(*a*) Early	(*b*) Late
Intracellular K^+ (m.eq. per 100 g. dry)	28	32	34	30	27	25
Intracellular Na^+ (m.eq. per 100 g. dry)	1	6	12	10	9	10
K^+ concentration (m.eq. per kg. (intracellular H_2O)	122	99	95	103	87	79
Na^+ concentration (m.eq. per kg. intracellular H_2O)	9	18	35	25	27	31

The cases of uterine inertia we studied were divided into two groups: (*a*) where there was delay in dilatation of the cervix in the first 24 hours of labour (cases of failed trial of labour); and (*b*) where labour was in fact prolonged for more than 48 hours, and cæsarean section had to be conducted for delay where the cervix was more than half dilated. In both these groups there was evidence of depletion of intracellular potassium, the values being most markedly reduced in group (*b*).

We feel that while the potassium concentration in the myometrial cells is reduced during normal pregnancy and labour, this is probably a physiological phenomenon due to hormonal conditioning and water retention rather than to a process of depletion or deficiency. When our values obtained from biopsies of myometrium at hysterotomy in early pregnancy are compared with those at term and in normal labour (table II) there is no evidence of progressive change in intracellular potassium. The reason why Dr. Cort and Dr. Cort find potassium reduction in their group of "normal" labours may be the incorporation in this group of cases of failed trial of labour and failure of the head to engage, with their implication of uterine inertia. Such cases (table II, delay in labour, early) do have much reduced intracellular potassium. We could find no such depletion in our biopsy specimens from patients in normal labour—cases who had been scheduled for elective cæsarean section but had gone into labour, and cases of fœtal distress, where there was no evidence whatsoever of incoördinate uterine action.

In conclusion, therefore, we feel that there is no clear evidence that the changes in uterine electrolytes occurring during normal pregnancy and labour are other than physiological, or that the reduction in intracellular potassium that occurs can be regarded as a deficiency. These changes may well be the consequence of changed hormonal influence—Talbot et al.,[3] and Horvath [4] have shown that hormonal changes can influence the uterine electrolyte balance. We fully agree with Dr. Cort and Dr. Cort that in uterine inertia there is a deficiency of potassium in the myometrial cells. We have shown, in

1. Nixon, W. C. W., Smyth, C. N. *J. Obstet. Gynæc., Brit. Emp.* 1957, **64**, 35.
2. Daniel, E. E., Boyes, D. A. *Amer. J. Obstet. Gynec.* 1957, **73**, 395.
3. Talbot, N. B., Lowry, O. H., Astwood, E. B. *J. biol. Chem.* 1940, **132**, 1.
4. Horvath, B. *Proc. Nat. Acad. Sci.* 1954, **40**, 515.

fact, in another study,[5] that plasma-potassium also falls in long labour—an effect we attributed to prolonged hypersecretion by the adrenal cortex. This intra- and extra-cellular potassium depletion may well contribute to the uterine inertia.

The use of rational intravenous electrolyte administration in uterine inertia might be very productive, and we await the introduction of such therapy with great interest.

Obstetric Unit,
University College Hospital,
London, W.C.1.

D. F. HAWKINS
W. C. W. NIXON.

HEAD INJURIES

SIR,—The letters of Mr. Lowden (Jan. 12) and Professor McConnell (March 2) prompt me, albeit with some diffidence, to offer yet another solution to the problem of acute extradural hæmorrhage occurring at a distance from a neurosurgical centre.

Twice in the past three years I have been faced with this problem. The first patient, a child of three years, was 150 miles distant and the second, a youth of 17, was over 200 miles away. In each case the classical signs of extradural hæmorrhage, including coma, had supervened within three hours of an apparently trivial head injury. Air transport to this centre was arranged; but, because even this method of transfer was not likely to prove rapid enough in view of the early onset of coma, the referring physician was advised to make a burr-hole in the appropriate temporal fossa and pack the wound open while awaiting the arrival of the air ambulance. (In the first case the burr-hole was actually made with an ordinary brace and bit obtained from the local ironmonger.) Both patients arrived with somewhat bloody dressings but otherwise in sufficiently good condition to make excellent recoveries following evacuation of their extradural hæmatomas.

Grey Nuns Hospital,
Regina, Saskatchewan.

P. B. RYAN.

CLEARANCE RESULTS IN OLIGURIA

SIR,—Phillips et al.[6] stated that division of the clearance for any substance by the intrarenal plasma extraction of the same substance gives the value for renal plasma-flow (R.P.F. = $\frac{C}{E}$). Consequently the R.P.F. multiplied by the E for any substance will give the clearance for that substance (C = R.P.F. × E).

In the dog dehydrated by thirsting we determined R.P.F. by measuring directly the blood-flow from the renal vein and the inulin, creatinine, and P.A.H. extraction by analysing arterial and renal venous blood. The clearance of these substances was also determined. We found, that, below a diuresis level of 0·35 ml. per min. per sq. m. (i.e., in oliguria) the value of $\frac{C}{E}$ is but a fraction of the directly measured value. As extraction (E) is normal in oliguria, the low $\frac{C}{E}$ value can be ascribed to a misleadingly low clearance value only. On enhancing diuresis by mannitol or saline infusion the difference between the direct value and $\frac{C}{E}$ disappears inasmuch as R.P.F. and E change very little, but the clearances increase to their true value.

This finding has placed in a different light Chesley's statement[7] that in man the urinary concentration of different substances does not change below a diuresis value of 0·35 ml. per min., and in that range the value of clearance is proportionate with that of urine output. Our data indicate that in extreme oliguria the regulation of diuresis does not become a glomerular function, but the clearance values are unreliable. We believe that in oliguria, even in clinical practice, one should be very cautious in evaluating clearance results.

A detailed account of our data is to be published in *Acta physiologica hungarica*.

Physiological Institute,
University of Budapest.

P. BÁLINT
E. KISS
S. SZALAY.

5. Hawkins, D. F., Nixon, W. C. W. (In course of publication).
6. Phillips, R. A., Dole, V. P., Hamilton, P. B., Emerson, J., Archibald, R. M., Van Slyke, D. D. *Amer. J. Physiol.* 1946, **145**, 314.
7. Chesley, L. C. *J. clin. Invest.* 1938, **17**, 119, 591.

RHEUMATOID ARTHRITIS WITH CHRONIC LEG ULCERATION

SIR,—In their courteous reply of March 30, Dr. Allison and Dr. Ray Bettley have paid but scant attention to what they themselves agree is the crux of their whole argument—namely, that in their cases they could apparently rule out any question of venous stasis because the ulcers failed to heal in bed.

To say "we need hardly detail the bed rest and ancillary treatment" is to present statistics without figures, for if bed rest is not completely and accurately controlled in these patients it may quite well *appear* to be worse than useless.

Many with stasis ulcers give a history of these failing to heal despite prolonged "bed rest." Fortunately most of them can be healed by elastic adhesive ambulatory compression; but in the very difficult cases that we are discussing, in which ambulation is reduced to a painful and pitiful minimum, bed rest will invariably do the trick provided the patient *lies down* (twenty-four hours a day, except for meals and their excretion) *in a bed tilted nine inches at the foot*.

My impression is that the Middlesex cases were *not* so treated, and I must emphasise once again that until this has been tried there is positively no evidence on which vascular stasis can be excluded as an ætiological factor.

London, W.1. STANLEY RIVLIN.

SIR,—Like Dr. Rivlin, I fear that Dr. Allison and Dr. Ray Bettley's conclusions (Feb. 9) are not quite justifiable. I had the opportunity to treat 3 patients similar to those they cite, and I report here the history of 1 who is still under my care.

Six years ago a housewife aged 50 first had symptoms of rheumatoid arthritis which steadily increased in severity and caused much deformity. Three years ago many cutaneous nodules began to appear over the elbows and the backs of the thighs. From time to time one or two nodules broke down and punched-out ulcers were formed which healed rather easily. She ran a fever for a long time, with spikes as high as 39°C (102°F). In the past skin eruptions had very often been controlled with anti-histamine drugs.

Fifteen months ago she was further crippled by a big ulcer on the outer surface of the lower third of the right leg. The ulcer appeared on the fifth day of a course of treatment with cortisone, which was therefore stopped. Previous treatment of the arthritis included courses of gold, salicylates, phenylbutazone, and iodides. The ulcer healed very slowly, probably because she was not strictly confined to bed. When bed rest was ordered with the leg raised above the level of the heart, after three months it was completely healed.

Apparently the ulcer resulted from vascular stasis caused by the restricted muscular activity in the leg. Interstitial œdema and decreased tissue resistance induced by cortisone may also have played a minor part.

It is hard to accept the diagnosis of lupus erythematosus in the cases described by Dr. Allison and Dr. Ray Bettley. Not only leg ulcers but also true allergic manifestations (skin eruption, drug sensitivity, and sometimes bronchial asthma) are quite common in rheumatoid arthritis. Surely not all these patients have disseminated lupus erythematosus. It would be better perhaps to put all these patients into the category of rheumatoid arthritis with collagenous manifestations.

Athens. G. E. PAPAYANNOPOULOS.

PHENYLBUTAZONE IN SUPERFICIAL PHLEBITIS

Sir,—Dr. Gillhespy's observation (April 6) on the therapeutic effect of phenylbutazone in superficial phlebitis could be explained by its anticoagulant action, investigated and described by Humble.[1]

If in fact this is the correct explanation, phenylbutazone might not offer any advantage over the established anticoagulants, since its effect in this respect would appear to be variable and unpredictable.

Twickenham, Middlesex. DAVID WHEATLEY.

EMULSIFIERS AND CORONARY THROMBOSIS

SIR,—Much has been published in the daily press lately on the increase in the number of cases of coronary thrombosis, the main suspicion being directed at the amount of animal fat consumed by the class of person most likely to be afflicted.

May I, just a layman, point a finger of suspicion at certain substances which are being used in ever-increasing quantities in many of the common items of food more than likely to be eaten by the same class of persons.

I refer to glyceryl monostearate and other emulsifiers which enable fats to be mixed easily with water, and I would suggest that when they are consumed in the diet in large quantities they may be absorbed and alter the state of the fat in the blood and so possibly be responsible for the damage to the arteries and cause thrombosis.

Taking this matter a step further, the use of detergents, which are also emulsifiers, for washing up crockery, and which are not properly rinsed off, can introduce into the digestive organs another substance which may alter the state of the fat in the blood.

Glyceryl monostearate is used as a crumb-softener in much of today's bread, in ice-cream to increase the bulk or volume from a given weight of fat, in cake-mixes to enable the house-wife to make quicker cakes, and in prepacked cakes which remain soft for many days.

I think investigations along these lines might prove very profitable, although I must confess I send this letter with trepidation.

Bristol, 4. F. J. ROBERTS.

FRACTURES OF THE FEMORAL NECK

SIR,—Mr. Newman (March 30) paid a generous tribute to a factual review by Dr. Murray and Mr. Young (March 23) of fractures of the neck of the femur treated at the Southern General Hospital, Glasgow. He noted a high mortality-rate and, while accepting the likelihood of error in any statistical comparison, suggested that this was evidence against delay in operation.

As an illustration that we are dealing here with a particularly poor-risk group, it should be said that some of our cases have been discharged home from other city hospitals as being unfit for surgery and thence admitted to our wards by the Beds Bureau. The high mortality quoted (33% overall, 26% for operative cases, and 48% for those treated conservatively) is also a measure of the difficulties of disposing of geriatric cases from acute surgical wards.

Mr. Newman compared this with an average mortality of 16·8% among 564 patients treated surgically, collected from the literature. The mortality-rate for our 139 patients treated surgically *was 14% in the first twenty-eight days.*

This would surely provide a fairer figure for comparison, since as far as American publications are concerned at least, it is rare for a bed in an American hospital to be occupied by the same patient for twenty-eight days. Few of our patients went home within twelve weeks.

Certainly if we are to compare the results of immediate operation (within twenty-four hours) with those of elective operation (average time from fracture till operation, four days) surely the mortality-rate in the first month is the figure to take.

Southern General Hospital, Glasgow, S.W.1. W. SILLAR.

CYTOLOGICAL DETECTION OF UTERINE CANCER

SIR,—Dr. Anderson (April 6, p. 738) is quite correct when he states clearly that cytology is no longer an untried method in the research stage, but in the Birmingham study [1] of the value of cytology in gynæcological practice which we carried out at the request of the Royal College of Obstetricians and Gynæcologists, the establishment of the technique in the hands of technicians (none of whom is medically qualified) amounted to research.

First of all we had to show that in our hands the technique would confirm the presence of obvious cancer of the cervix, which was soon established. A lower efficiency, however, was inevitable in cancer of the corpus for cells are not shed regularly or may be swamped with blood. The most important part of our research, however, was to find out for ourselves how many cases of cancer we were missing in routine investigation of outpatients. To keep our clinical practice up to a high standard we used a questionnaire and we inspected the cervix with great care. Since 1954 we have abandoned the detailed questionnaire and simply write down on our case-sheets in the outpatient department that this patient has or has not carcinoma of the corpus or cervix. We are thus tied down as clinicians, leaving the cytologist a chance to claim a " pick-up " for the technique, should cancer cells be obtained from a clinically normal case.

How many cases were we missing, for obviously 1 per 10,000 would have made the technique valueless, whereas 2% would have made it almost obligatory for our or for any gynæcological clinic ! We found that in 2250 patients (in two years) we had missed 1 case of early cancer of the cervix. We also missed 1 case of carcinoma of the corpus which escaped our exploratory curette, but the risk to her life was less in that postmenopausal bleeding would have made hysterectomy obligatory without positive smears.

Our conclusion was therefore that, in our practice, cytology was almost never required to reach a diagnosis of uterine carcinoma. But cytology led us to discover 8 examples of carcinoma-in-situ which would have escaped our usual investigations. We have now screened over 5000 patients and the figure of 3 per 1000 is being maintained. With many hundreds of hours of microscopy was this a reasonable " harvest " ! We concluded that it was and in this came into line with many centres in the U.S.A. and elsewhere, including this country.

M. J. D. Noble and M. E. Attwood have applied this " search " technique to diabetics (Dr. J. M. Malin's patients) and this study is ready for publication. Their " harvest " is greater than in our outpatients, not only for invasive but also for " in-situ " lesions.

Studies are also continuing in the field of therapy ; for instance, 13 of our cases of carcinoma-in-situ have been " treated " simply by deep ring biopsies—i.e., we have the beginnings of information on therapy.

Dr. Anderson suggests that although cytology per se is not research the technique can be used as part of research into the natural history of cancer. I suggest that the operative word " can " should be replaced by " must," but in this my colleague, Dr. C. W. Taylor, director of pathology, Birmingham Hospital for Women, does not entirely agree with me. My opinion is based not simply on the fact that it takes hundreds of hours of microscopy to discover 1 case of carcinoma-in-situ but that each case should be a subject of study to offset the time-consuming work by the cytologist.

1. Humble, J. G. Empire Rheumatism Council Symposium on Butazolidin. Nov. 13, 1953.

1. McLaren, H. C., Taylor, C. W., Attwood, M. E. *J. Obstet. Gynæc., Brit. Emp.* 1956, **63**, 801.

In our own firm, ordinary clinical study involves the automatic admission of all patients with positive smears for ring biopsy and curettage; this is followed by long-term follow-up studies by the clinicians and cytologists and, of course, a complete study of the histology may require us to undertake radical surgery. In other words, we are recording facts which may be of use to us when presented with therapeutic problems—e.g., the woman of 28 with carcinoma-in-situ who wishes to have a family.

I believe further that the time has now come to carry out what Malcolm Donaldson proposed in 1951—namely, that our findings and our results should be centralised in a "British committee for the study of carcinoma-in-situ." The condition is rare so that individual centres in Worcester, Derby, Glasgow, Newcastle, Liverpool, Manchester, Oxford, and London, where cytologists are at work, are unlikely to find sufficient cases or to study them long enough to give us within a reasonable time some knowledge to guide us in therapeutic problems. Therapy, of course, is based on a knowledge of the natural history of carcinoma-in-situ.

To sum up, then, I agree with Dr. Anderson that cytology is not per se research but offers a challenge to those who employ this most tedious and time-consuming test not to be content with a "routine service" but to write up every case with care, and to include prolonged follow-up irrespective of the therapy employed. An appeal is also made for an extension of the work at present centred in the Royal College of Obstetricians to include all centres willing to take part in a joint effort to increase our knowledge of what is a most interesting and ill-understood condition—carcinoma-in-situ.

Queen Elizabeth Hospital, Birmingham, 15. H. C. McLAREN.

SIR,—Your leading article of March 23 surprised me by its arguments. Some 15 years after the introduction of cytology into gynæcology, at a time when cytology has not only been fully recognised and established as a diagnostic method in the United States but is already represented by regional professors of the specialty, we are still asking in Britain, "is cytology really necessary?"

There should no longer be any doubt that cytology can detect cancer cells in vaginal secretions, that these cancer cells may come from the vagina, cervix, endocervix, body of the uterus, or, occasionally, from the ovaries, and that clinically unsuspected malignancies (be it that the lesion is microscopical or outside the reach of the inspecting eye) are recognised at a stage when other methods fail. There is equally no doubt that cytology does not provide a 100% guarantee of a correct diagnosis. No laboratory method is infallible: there are as many pitfalls in biopsy techniques, and anyone who expects that the laboratory can replace clinical judgment lives in a fool's paradise.

Is it really of paramount importance which figure of "pick-up rate" (Anderson's 1·1% or McLaren's 0·44%) is more accurate, and do you really think the fate of cytology should depend on this assessment? "Pick-up rates" vary according to the material screened, and depend also to a large extent on the clinical acumen of the gynæcologist as well as on the skill and experience of the cytologist. All these points are variables and it is, therefore, not surprising that different figures are quoted in the literature. It might be wise if, before discussing "the true value of cytology," we first found a definition of what constitutes a cytologist. It appears that judgment on the value of cytological investigation is often passed by people who have been toying with the technique for a short while and, for lack of competition in this field, feel entitled to regard themselves as authorities.

Early cancer detection is but one aspect of the method and there are others. Vaginal cytology offers useful and reliable information on ovarian function during the reproductive period and provides important help in the decision as to what type of hormonal treatment should be used in menopausal disturbances. Lastly, it plays a unique rôle in cancer follow-up examinations as a detector of early recurrence or failure of response to treatment.

May I finally make a plea for cytology? Do not let us lose our sense of proportion when evaluating a new method by demanding the impossible. Do not let us forget that the vaginal-smear technique is just one way of examining a patient, widening the field of diagnostic possibilities, and should be used in addition to but not instead of the other time-honoured methods. We argue about a failure-rate of approximately 10%, but do not let us forget that there are still 90% of patients who benefit by the method.

Institute of Obstetrics and Gynæcology, Hammersmith Hospital, London, W.12. ERICA WACHTEL.

HASHIMOTO'S THYROIDITIS

SIR,—Two recent papers[1] in which Hashimoto's thyroiditis or struma lymphomatosa are mentioned in the titles raise an important question. When dealing with a condition which is not an everyday matter, it is, I think, necessary to define it beyond a perfunctory "histological sections showed the typical appearances of Hashimoto's thyroiditis," with or without the name of the doctor diagnosing the material. It has been my own experience[2] that too often what is commonly referred to as "Hashimoto's struma" is not what Hashimoto[3] described, but what appears in textbooks, which, as I recall Gooch's remark about history texts that one is a copy of the other plus the spice of original error, is usually erroneous. May I suggest that a brief summary of diagnostic criteria be included in any paper which seeks to discuss the less common pathological states.

Los Angeles. S. M. RABSON.

GOVERNMENT AND PROFESSION

SIR,—I read with great interest Dr. Fry's letter (March 30) and should like to support and reinforce much of what he says.

If a Royal Commission is to sit on doctors' remuneration, then the terms of reference should be so wide that the whole system of remuneration of general practitioners will be brought under review, and for this purpose doctors should be added to the existing lay members.

Is it not long past time to change a system which penalises the good doctor; which can pay to the experienced clinician the same emoluments as to his youngest colleague; and which offers as the only inducement to the keen and able doctor, if he wants a good reward, the compilation of a big list, with no hope of easing up until he retires?

What is the alternative? What method could be introduced which would encourage good practice only; which would offer incentive to the young, and some relief to those getting on in years? Here I break away from Dr. Fry and put forward my own proposals.

The general practitioner's income in future should be made up as follows:

(*a*) An expense factor.—This would very broadly cover his practice expenses as allowed for income-tax purposes, thus giving the doctor every day as he starts the day's work a tranquil mind, without having to think "Have I got enough heads to live?"

(*b*) A length-of-service factor, as in other Government medical appointments.

(*c*) Awards for special skills or a very high level of service.

(*d*) Locality allowance, to be paid to doctors who practice in specially difficult areas or in resorts largely inhabited by old people.

1. Luxton, R. W. *Lancet*, March 2, 1957, p. 441. Morgans, M. E., Trotter, W. R. *Ibid*, March 16, 1957, p. 553.
2. Rabson, S. M., Arata, J. E. *Amer. J. clin. Path.* 1949, **19**, 751.
3. Hashimoto, H. *Arch. klin. Chir.* 1912, **97**, 219.

(*e*) A capitation fee, uniform throughout the country, to be paid for each patient.

This method would encourage good practice, reward experience, and console those who work in difficult areas.

Worthing. HAROLD LEESON.

TRAINING IN ADMINISTRATION

SIR,—Your readers will notice in your advertisement columns this week that the Newcastle Regional Hospital Board are advertising for an administrative medical officer, that no administrative experience is called for, and that a clause is used saying that facilities for training will be offered. May I enlarge on this advertisement for what is essentially a trainee appointment?

No concerted action has, to the best of my knowledge, been taken in this country to train medical administrators, and the Newcastle board are hoping to do something of a pioneer nature. It is hoped that applications will be forthcoming from those whose experience is solely clinical or solely in public health; if such a candidate is appointed to the post, a planned programme of training will be undertaken, including attendance at suitable courses and secondment to general, special, and mental hospitals for varying periods. Very probably the doctor appointed will also be "lent out" for periods of perhaps a week at a time to one or two hospital management committee group centres in order to see the work at this level. Should the doctor appointed wish to take a higher qualification, full facilities for this will be offered; should he wish to take the D.P.H. examination of the University of Durham suitable time off will be given in order to allow this.

Newcastle Regional Hospital Board, Benfield Road, Newcastle upon Tyne, 6. R. H. M. STEWART, Senior Administrative Medical Officer.

SHERRINGTON CENTENARY

SIR,—This is the centenary year of the birth of Sir Charles Scott Sherrington, O.M., a founder and main architect of the physiology of the nervous system. The Royal Society of Medicine, wishing to pay tribute to his life and work, proposes to raise a fund towards a Sherrington lecture, for the furtherance of knowledge on the nervous system, to be delivered from time to time in the society's rooms in London. It is felt that many will wish to contribute: both those who were his friends, pupils, and colleagues, and those, more numerous, who, as patients, doctors, and scientists, have benefited indirectly from his work. We wish to take this opportunity to commend the endeavour of the Royal Society of Medicine to establish this memorial to a great pioneer in scientific medicine.

Donations should be made payable to the secretary, the Royal Society of Medicine, 1, Wimpole Street, London, W.1, and cheques crossed "Sherrington Memorial."

RUSSELL BRAIN
President, Royal College of Physicians

LINDOR BROWN
Foreign Secretary, Physiological Society

JOHN FULTON
Stirling Professor of the History of Medicine, Yale

W. R. HENDERSON
President, Society of British Neurological Surgeons

CYRIL HINSHELWOOD
President of the Royal Society

E. G. T. LIDDELL
Waynflete Professor of Physiology, Oxford

D. W. C. NORTHFIELD
President, Section of Neurology, Royal Society of Medicine

CLEMENT PRICE THOMAS
President, Royal Society of Medicine

CHARLES SYMONDS
President, Association of British Neurologists

FRANCIS WALSHE
Chairman, Sherrington Memorial Committee, Royal Society of Medicine.

Medicine and the Law

Shortening of Life

THE trial of Dr. John Bodkin Adams on a charge of murdering a patient by administering drugs has been reported at great length in the national press, and there is no need to review here the course of the longest murder trial in English history and one which ended in the acquittal of the accused. But the judge's summing-up, which lasted for four hours, contained some important remarks on the position of a doctor after health can no longer be restored to a patient.

Mr. Justice Devlin began by emphasising a point which is familiar enough to the medical profession—namely, that no one has the right deliberately to cut off life. Murder, he said, was "an act or series of acts done by the prisoner which were intended to kill and did in fact kill." It did not matter for this purpose that death was inevitable. If life were cut short by weeks or months, it was just as much murder as if it were cut short by years. The jury, said his Lordship, had heard a good deal of discussion about the circumstances in which doctors might be justified in administering drugs which would shorten life—cases of severe pain had been suggested and also cases of helpless misery. "The law knows of no special defence of this category."

His Lordship went on to say, however, that this did not mean that a doctor aiding the sick or dying had to calculate in minutes or hours or perhaps in days or weeks the effect on the patient's life of the medicines he administers. "If the first purpose of medicine—the restoration of health—can no longer be achieved, there is much for the doctor to do, and he is entitled to do all that is proper and necessary to relieve pain and suffering, even if measures he takes may incidentally shorten life."

The judge was careful to explain what this last statement meant:

"It is not the case that there is any special defence for the medical man and it is not the case that doctors are put into any different category to other citizens. What I have said rests merely upon this part of the offence of murder, that no act is murder which does not cause death—and 'cause' means nothing technical or scientific; it means what you twelve men and women sitting as a jury in the jury-box would regard in a common-sense way as the cause.

"Manifestly, there must be cases in the hospitals day after day in which a doctor is faced by whether giving certain treatment or omitting to give certain treatment prolongs or shortens life by hours and perhaps even longer.

"The doctor who decides to administer a drug, or not to administer a drug, is not of course thinking in terms of hours and minutes of life. He could not do his job properly if he were.

"If for example a doctor has done something or omitted to do something and death occurs say on the 11th or 12th or on the Monday instead of the Tuesday, no one with commonsense would say the doctor caused the death.

"They would say the cause of death was the injury or whatever it was that brought her to hospital. It remains a fact and remains the law that no doctor, nor any man, has the right to deliberately cut off life. I say it to you so there can be no mistake.

"It does not enter into the defence at all. No defence has been put forward that has vested any right in Dr. Adams to make this determination in this case or any other case.

"Counsel for the defence is saying that treatment given by Dr. Adams was treatment designed to promote comfort, and if it be the right and proper treatment, the fact if it be that it shortens life does not convict him of murder."[1]

In concluding this part of his summing-up, Mr. Justice Devlin referred to the use of the word "justify" in relation to a course of treatment. It was, he said, a pity that the word had ever been brought into the case. To the lawyer it suggested some legal justification.

"In this case the word 'justify' was used purely in the medical sense. If a doctor is going to prescribe a course of drugs, we have heard the sort of dangers that may result.

"The patient may become comatose and the effect on the patient may be a complication, pulmonary congestion and so forth, and it may lead to death, and therefore the doctor who is going to prescribe this treatment has to consider that and has to ask himself whether he is justified in a medical way in running that risk.

1. *Evening Standard*, April 8, 1957.

"The word 'justify,' as I understand it, has been used purely in that way. Dr. Ashby has said there was no such dreadful discomfort as would justify the administration of those drugs, and he is saying simply the risks that were being run by administering those drugs were not justified."

Permanent and Pensionable

A woman clerical worker sought in the Chancery Division and the Court of Appeal of Northern Ireland a declaration that her engagement under the Northern Ireland General Health Services Board had not been validly terminated; and eventually appealed to the House of Lords against decisions in favour of the board. The House of Lords by a majority (Lord TUCKER and Lord KEITH of AVONHOLM dissenting) allowed her appeal.

In June, 1948, when unmarried, she applied for a post as senior clerk under the board. The post was advertised in a Belfast newspaper and the advertisement stated that "subject to a probationary period appointments will be permanent and pensionable." She was selected for appointment, resigned from her previous employment, and started work on a six-month probationary period in August, 1948. Shortly after starting work, she was handed a document containing the full conditions of service. They included the following clause:

"Dismissal and reduction in rank, and termination of employment otherwise: The Board may dismiss any officer for gross misconduct and may dismiss any officer who is proved to their satisfaction to be inefficient and unfit to merit continued employment. Except where an officer has been guilty of gross misconduct, the Board shall give at least one month's notice of their intention to exercise their powers of dismissal under this rule. As an alternative to dismissal, the Board may order the reduction in rank of an officer who is found by them to be unfit to discharge the duties of the grade in which he has been employed. One month's notice in writing shall be given by all permanent officers who wish to terminate their employment with the Board."

In February, 1949, having served her probationary period, she was confirmed in her post. On Aug. 14, 1950, the board inserted in the conditions of employment a condition that "female officers will on marriage be required to tender their resignations to the Board." After being advised that that condition did not apply to officers already on the staff, she got married in March, 1951. The board thereafter sought to determine her employment by notice expiring in August, 1954.

In the House of Lords Lord OAKSEY said that the question depended on the construction of the contract. The board had contended that in the case of a general hiring for an indefinite time a master was entitled to give his servant reasonable notice and that the contract in question was one of master and servant for a general hiring. In his Lordship's opinion this was not a simple contract of general hiring for an indefinite time. It began by an offer of a permanent and pensionable post; and the contract incorporated provisions that the officer was entitled to an annual pension on a contributory basis on completing 10 years' service in circumstances of ill health or on attaining the age of 60, a short-service gratuity for 5 years, and other pension rights and allowances for sickness. To offer an officer a permanent and pensionable post on such terms and then to claim the right to give him notice which would deprive him of all the pension and other rights offered by the express terms of the contract not only was not a right which the parties must have intended the master to have but one which no reasonable person could have contemplated he would claim. The appeal should be allowed.

Lord GODDARD, concurring, said that, while he did not think that because a person was offered pensionable employment the employer thereby necessarily engaged to retain the employee in his service long enough to enable him to earn a pension, nevertheless when one considered the express condition here relating to dismissal the fact that the offer in the advertisement was for permanent and pensionable employment assisted in construing it. On the true construction of clause 12 the board had debarred themselves from giving notice apart from the reasons specified therein.

Lord TUCKER, dissenting, said that the natural meaning of the words "permanent and pensionable" in their context in the advertisement indicated no more than that the posts available were on the regular established staff and were subject to the terms of a pension scheme. The advertisement formed no part of the eventual contract. The appellant could not reasonably have supposed that the final terms of her contract would give her the legal right to a life appointment.

Lord KEITH of AVONHOLM, also dissenting, said that the case might have repercussions on the powers of public bodies or authorities which did not rank as branches of the Civil Service to terminate the employment of their servants. If the appellant succeeded the position would be the more remarkable in that it would be only the board that was bound, for the servant was entitled to terminate her employment at one month's notice.

Lord EVERSHED, who concurred with the majority of the House, said that the result of the decision might be to saddle the board with contracts which they ought not reasonably to have undertaken; but to a servant, certainly one in the position of the appellant, the security of employment with the board for the period of working life was of immense value.

McClelland *v.* Northern Ireland General Health Services Board. *House of Lords* (Lord Oaksey, Lord Goddard, Lord Tucker, Lord Keith of Avonholm, and Lord Evershed). April 4, 1957. E. W. Jones, Q.C., and C. B. Shaw (Gouldens for J. Morris McKee, Belfast); W. F. Patton, Q.C., and John MacDermott (Hewlett & Co. for Cleaver, Fulton & Rankin, Belfast).

M. M. HILL
Barrister-at-Law.

Allegations Withdrawn

Allegations of negligence against a casualty-officer were withdrawn after a hearing at Birmingham Assizes.[1] A widow claimed damages for the death of her husband in Nuneaton Manor Hospital from the casualty-officer and the Birmingham Regional Hospital Board.

Her husband, who was 39, was taken to hospital by his family doctor because he was having difficulty in breathing. The doctor told the casualty-officer that, in her view, the patient had "an acute condition of the larynx" and would probably need a tracheotomy. She impressed on him that it was a serious emergency and then left the hospital. Counsel for the plaintiff said that though suing both defendants, from what the hospital had told him he was putting his case "fairly and squarely" against the casualty-officer, and he spoke of a "deplorable state of inefficiency and panic." When the patient's wife arrived at the hospital, no-one was able to tell her anything. Later she was taken to the matron's office, where another doctor broke the news to her that her husband had died.

In evidence the patient's family doctor said that when she heard the man had died she asked the casualty-officer why "on earth" he had not attempted the tracheotomy. He replied that there had not been time.

Counsel for the casualty-officer denied that his client had done "simply nothing" when the patient was brought in. He had done everything possible before he tried to get in touch with an ear, nose, and throat surgeon. In his evidence, the casualty-officer said that on the day in question his immediate superior and two other doctors were away. When the patient was brought in he ordered an injection and telephoned a surgeon, who told him not to do the operation until told to do so by the surgeon-on-duty. He was unable to contact the surgeon-on-duty and while he was telephoning the first surgeon to say he intended to operate, he was told the patient had died.

A consultant ear, nose, and throat surgeon gave evidence that a hurried tracheotomy was often very difficult "even to an expert." Counsel for the plaintiff announced that, in the light of this surgeon's evidence, it would not be right to proceed with the allegations of negligence. The plaintiff recognised that the casualty-officer had been faced with a most difficult dilemma.

Counsel for the casualty-officer said that facts which had been clearly established at the hearing were not known to the plaintiff at the beginning of the case; and Mr. Justice Pearce, agreeing to withdraw the record, said it was clear the patient was suffering from a rare disease which was very difficult to diagnose and treat.

1. *Times*, April 9, 10, 11, and 12.

Obituary

GEORGE RITCHIE MATHER CORDINER

C.V.O., M.B. St. And., D.M.R.E.

Dr. Mather Cordiner, honorary radiologist to St. George's Hospital, died at his home in London on April 8 at the age of 58.

He graduated M.B. from the University of St. Andrews in 1922, and after holding a house-appointment at Gravesend Hospital he served as a clinical assistant in the X-ray and electrical departments of the Prince of Wales's Hospital, Tottenham. In 1924 he took the D.M.R.E., and soon afterwards he became assistant radiologist to the Middlesex Hospital. He also joined the staffs of the Evelina Hospital, St. Paul's Hospital, the Royal Northern Hospital, and Oldchurch Hospital, Romford. In 1935 he was appointed assistant radiologist and later radiologist to St. George's Hospital, and after the introduction of the National Health Service he continued to serve the hospital as an honorary consultant. He lectured in radiology at the London School of Hygiene and Tropical Medicine.

Dr. Cordiner was one of the consultants who attended the late King George VI, and for these services he was appointed C.V.O. in 1951.

A colleague writes:

When George Mather Cordiner was appointed to St. George's Hospital in 1935 he was already making a name for himself in the radiological study of gastro-enterology, and before long he had a world-wide reputation in this field. His unassuming manner cloaked a high intelligence and an unflagging capacity for work. Many of us were aware that he held decided opinions on the question whether the National Health Service was in the best interests of patients and of the medical profession, but this did not prevent him from carrying out with enthusiasm and devotion the work to which he had set his hand. In this connection a great debt of gratitude was owed to him, especially by St. George's Hospital. To his unostentatious generosity I, and many other of his younger colleagues, can bear witness.

Dr. Cordiner leaves a widow and a son and a daughter.

ALBERT EDWARD MORTIMER WOOLF

M.B. Camb., F.R.C.S.

Mr. Mortimer Woolf, consulting surgeon to Queen Mary's Hospital for the East End, a past president of the Hunterian Society, and the present editor of its *Transactions*, died on April 6 at his home at Loughton, Essex.

He was born in 1884, the son of the late Mortimer Woolf, O.B.E., and he was educated at Clifton College and Emmanuel College, Cambridge. He completed his medical studies at the London Hospital and qualified in 1908. While holding house-appointments at the London he took his F.R.C.S. in 1909. He was already finding his way in consultant practice when the war came, and he spent the next years serving as a surgical specialist with the R.A.M.C. in France, Mesopotamia, India, and Serbia. After he returned to civilian life he joined the staffs of Queen Mary's Hospital for the East End, the British Red Cross Rheumatic Clinic, St. Margaret's Hospital, Epping, the East End Maternity Hospital, and the Lord Mayor Treloar's Home at Alton.

Mr. Woolf gave practical form to his admiration for John Hunter through his devoted service to the Hunterian Society. For many years he was its honorary secretary and he was elected president from 1926 to 1928 and again in 1945. He was also for long the society's librarian, and since the late war he had edited its *Transactions*. His aptitude for this work was seen in his own papers, many of which dealt with surgery of the gall-bladder and other aspects of abdominal surgery. In one of his presidential addresses to the Hunterian Society in 1928 he examined pain from the surgeon's point of view, and in his Hunterian oration in 1931 he followed Hunter's example by turning to comparative anatomy for help in the elucidation of the problems of diverticulitis.

D. T. D. writes:

There was something of Mr. Pickwick in Mortimer Woolf. Many of his friends called him Teddy and his presence in any company was always palpable as well as visible. His joy in human company, his quick spontaneous laughter, his delight in jokes made him countless friends. Like Mr. Pickwick he was not unendowed with the goods of the world, and he was able to foster good causes and spend much of his time in making other people content.

It mattered not whether it was exhorting the Hunterian Society to business, or whether it was discussing some topic at the dinner-table, or whether it was showing to friends the ancient trees in his delightful garden—it was done with great fun and with tremendous relish. To Mortimer more than to anyone the Hunterian Society owes its present lively condition, and no council or committee or dinner of that society was ever complete without some quip or some words of wisdom from Mortimer Woolf. Every institution that was fortunate to have him a member soon realised that every ounce of his enormous boundless energy would be used for that institution's welfare.

He was a big man, big in physical frame and with a healthy florid complexion; his mind was also large, tolerant, and honest, and he was always ready to hear the troubles of those afflicted and to give all the help he could to ease them on their way.

One sunny afternoon I watched him show with pride his garden to another great gardener, the late Lord Horder; and it was amusing to see the one examining the other in knowledge regarding the soil and regarding the health and the diseases of trees. It was an examination conducted by one on the other, and I think that after some two hours both would have passed each other as being reasonably qualified in the knowledge they possessed of some of Nature's secrets.

Mr. Woolf married Miss Laura Nathan who survives him with their two daughters.

THOMAS ARCHIBALD

M.D. Glasg.

Dr. Archibald who for 36 years, until his retirement in 1951, was physician-superintendent of Belvidere Hospital, Glasgow, died on March 26.

A native of Greenock, he was educated at Allan Glen's School and Glasgow University, where he graduated in medicine in 1908. He joined the staff of Belvidere Hospital in 1911, and became its physician-superintendent in 1915, at a time when infectious disease was a much greater menace to life and health than it is today. He found himself in charge of a busy hospital, often full to overflowing, and often called to meet emergencies, such as the almost yearly outbreaks of typhus fever, or unusual incidents, such as outbreaks of cerebrospinal fever and encephalitis lethargica. With the years he saw a decline in the incidence and a striking reduction in the severity of the commoner infectious diseases, and he played no small part in applying and assessing modern methods of treatment and prevention. When he retired in 1951 tribute was paid to the administrative resourcefulness and clinical acumen which had enabled him to share so effectively in the work of reducing the death-rates and complications of infectious diseases. "He did not seek the limelight, but went about his hospital work in a quietly efficient and admirable manner, and could be regarded indeed as the ideal physician-superintendent, placing first the interests of his patients and his staff."

In his retirement Dr. Archibald became a keen gardener and was justly proud of the results which he achieved by the same gifts of good husbandry and attention to detail that he had shown in former years in his professional work. He is survived by his widow.

GEORGE MITCHELL

M.D. Aberd., D.P.H.

Dr. Mitchell, dermatologist to the Royal Hospital, Wolverhampton, from 1919 to 1945, died on April 6 at the age of 81. He graduated at the University of

Aberdeen in 1903, and took the D.P.H. the following year, and the M.D. in 1905. After a short time in general practice he entered the public-health service, and from 1910 to 1912 he was chief school medical officer for Aberdeenshire. He spent the next two years as assistant M.O.H. and tuberculosis officer for Rochdale. During the 1914–18 war he served with the R.A.M.C. After he was demobilised in 1919 he was appointed to take charge of the venereal-diseases services for Wolverhampton, which were centred in what is now the Royal Hospital, and he held this post until he retired in 1951. His interest in diseases of the skin grew steadily and in recognition of his work in this specialty a department of dermatology was set up and he became the first dermatologist to the hospital.

J. H. S. writes:

George Mitchell was held in peculiar regard by all his colleagues in hospital, and by the practitioners of the district. His personality evoked a mixture of the deepest affection and respect. Respect for his intellectual abilities and intellectual honesty—two qualities by no means always synonymous—respect for his clinical judgment and integrity of life, qualities which to many of us seemed to typify the granite of his native country, but which by themselves could nevertheless suggest a personality essentially cold. By contrast it was his warmth and sense of humour which seemed to enlarge and almost transfigure his mental equipment—so that in the course of time he became a central figure beloved by all.

Diary of the Week

APRIL 21 TO 27

Wednesday, 24th

INSTITUTE OF DISEASES OF THE CHEST, Brompton, S.W.3
5 P.M. Dr. J. G. Scadding: Clinical Significance of Tuberculin Tests.

BIRMINGHAM MEDICAL INSTITUTE, 154, Great Charles Street, Birmingham, 3
8 P.M. *Psychiatry.* Dr. J. A. Harrington, Mr. K. W. Cross, PH.D.: Survey of Chronic Patients in a Mental Hospital—Comparison With a Sample From a Different Culture.

MIDLAND CENTRE FOR NEUROSURGERY, Holly Lane, Smethwick, near Birmingham
8 P.M. Dr. J. N. Cumings: Biochemical Abnormalities in Hepatolenticular Degeneration.

Thursday, 25th

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.2
3.45 P.M. Dr. B. D. Wyke: Surgical Considerations of the Temporal Lobes. (Arnott demonstration.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
4.45 P.M. *Dermatology.* Dr. J. T. Ingram: Parapsoriasis.
8 P.M. *Urology.* Mr. John Howkins, Mr. P. H. Newman, Mr. R. A. Mogg: Low Backache.

Friday, 26th

ROYAL SOCIETY OF MEDICINE
5 P.M. *Pædiatrics.* Dr. R. M. Mayon-White: Outbreak of Infantile Gastro-enteritis (*Esch. coli* O, 128) in a Small Hospital Maternity Unit. Dr. Bruno Gans, Dr. J. C. Thompson: Neonatal Œstrogen Excretion and its Relation to Postnatal Weight-loss. Dr. John Lorber: Changing Ætiology of Erythema Nodosum.

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, W.C.1
3.30 P.M. Mr. G. H. Howells: Sinusitis.

Appointments

COSH, J. A., M.D. Camb., M.R.C.P.: consultant physician, Bath clinical area.

DAVIES, P. D. B., M.D. Camb., M.R.C.P.: consultant chest physician, St. Pancras chest clinic and Whittington Hospital, London.

GRAINGER, R. G., M.D. Leeds, M.R.C.P., F.F.R., D.M.R.D.: part-time consultant radiologist, Hospitals for Diseases of the Chest, London.

MCDONALD, MARY G., M.B. Aberd., D.P.H.: M.O., mobile clinic, North Riding of Yorkshire.

MCNELIS, F. C., M.B.: assistant school M.O., York.

PINKERTON, PHILLIP, M.D. Edin., D.P.M.: consultant in child psychiatry, United Liverpool Hospitals and Liverpool regional hospital board.

SCOTT, D. P. A. L., M.B. St. And., D.P.M.: consultant psychiatrist, Rainhill Hospital, Liverpool.

STRICKLAND, BASIL, M.B. Lond., M.R.C.P., F.F.R., D.M.R.T., D.M.R.D., D.C.H.: part-time consultant radiologist, Hospitals for Diseases of the Chest, London.

TAYLOR, IAN, M.R.C.S., D.P.H.: assistant M.O., Ealing and Acton area.

TIMPERLEY, MARY, M.B. Manc.: school M.O., North Riding of Yorkshire.

Notes and News

IMPERIAL CANCER RESEARCH FUND

IT is hoped that demolition will begin this year in preparation for the new laboratories in Lincoln's Inn Fields.[1] In view of the expansion of research expected when the new buildings are complete, the clinicopathological research committee has been replaced by a research advisory committee to advise the council on the scientific aspect of all its activities. The new committee, whose chairman is Prof. G. F. Marrian, F.R.S., is actively considering what research will be done in the new buildings. Dr. A. M. Begg and Mr. H. G. Crabtree of the scientific staff have both retired this year.

The report includes some account by Dr. James Craigie, F.R.S., director of the central laboratories, and Prof. Geoffrey Hadfield, director of the clinicopathological research unit, of work in progress. This includes study of a possibly increasing malignancy of cells in a growth, of the behaviour of cancer cells in the presence of various gases, of the changes (if any) in a tumour which has been frozen, and of methods of determining œstrogens. Material from the "frozen-tumour bank" has been provided to other research establishments. The survival is reported of malignant cells for as long as seven years, without evident loss of viability.

COLLECTION OF PRESCRIPTION CHARGES

IN his annual survey[2] of the National Health Service accounts for England and Wales for 1955–56, the Comptroller and Auditor-General expresses concern about the collection of prescription charges by dispensing doctors. In August, 1953, the Ministry informed a number of executive councils that the returns of charges collected by dispensing doctors had varied greatly between one area and another and, in general, charges collected were a good deal less than might have been expected. Only 24 of the 47 councils concerned seemed to be satisfied with the rate of collections.

Returns for later periods, the Comptroller says, have shown little improvement. In 1954–55 remittances for all areas averaged about 1·8 statutory charges for the year for each patient on the dispensing lists, whereas collections averaged about 3 per patient for the year for patients whose prescriptions were dispensed by chemists. For doctors who were paid for prescriptions actually dispensed, the Comptroller's auditors reported many cases where remittances from doctors appeared inadequate in relation to the number of prescriptions dispensed and, occasionally, no remittances at all had been made during the year.

The report concludes: "Consideration had been given to the possibility of some abatement of the payments to dispensing doctors to take account of the charges they were required to collect. But it had not been found possible to negotiate a fixed abatement which, bearing in mind the conditions of rural dispensing practices, would be fair to all capitation doctors. This did not apply with the same force to the minority of doctors paid at drug tariff rates, but it had been agreed to accept the British Medical Association contention that they had similar difficulties in collecting charges, and that the adequacy of their collection of charges should therefore be assessed under the same procedure." The Exchequer and Audit Department proposed to remind executive councils of the need to investigate cases in which the amount surrendered appeared to be inadequate.

MENTAL FACETS OF MATERNITY CARE

THE latest memorandum submitted to the Maternity Services Committee deals with psychiatric matters.[3] It points out that the mental health of mothers is one of the most important factors governing the well-being of our children, and that pregnancy and parturition are responsible for a significant proportion of mental ill health. It recommends that the psychology of sex, pregnancy, and infancy, and the psychological abnormalities of pregnancy, labour, and the puerperium should be included in the training of obstetricians, midwives, and health visitors. Knowledge of the special emotional factors in illegitimacy is important. Education for

1. Imperial Cancer Research Fund: annual report for 1955–56. Obtainable from the offices at 48, Lincoln's Inn Fields, London, W.C.2.
2. H.M. Stationery Office. Pp. 41. 3*s*.
3. Memorandum for submission to the Maternity Services Committee. Royal Medico-Psychological Association, 11, Chandos Street, London, W.1.

parenthood should begin in childhood; this demands further study.

The memorandum calls, as did previous ones,[4 5] for coördination of the services; antenatal care and labour should be conducted by the same team. Antenatal education should be given to both parents. The pregnant woman must be given a proper explanation of what is coming, and she should never be left alone during labour. Analgesia must always be provided in case antenatal training has not abolished pain. Soon after birth, home help must be provided—by relatives, or otherwise if the relatives are unsuitable. Finally, there must be provision for psychiatric care of those mothers who, during pregnancy or the puerperium, show psychiatric symptoms. The commoner psychological upsets associated with pregnancy are set out.

SCOTTISH REGIONAL HOSPITAL BOARDS

THE following doctors have been appointed to the hospital boards. New appointments are indicated with an asterisk.

Northern region.—*James Ronald, * M. M. Whittet.
North-eastern region.—R. J. Duthie, * Prof. John Craig.
Eastern region.—* Prof. George Bell.
South-eastern region.—Prof. G. H. Percival and G. C. G. Mercer.
Western region.—W. W. Galbraith, * J. C. J. Ives and * Major-General J. M. Macfie.

SPEECH CORRECTION

A PUBLIC symposium was held in London on April 8 to demonstrate results achieved in the correction of speech defects by Mr. H. V. Hemery, L.R.A.M. Those who spoke were all at present members of Mr. Hemery's class, which has been held at Goldsmiths' College, New Cross, S.E.14, for the past twelve years. All read their speeches but all delivered them clearly and audibly, apart from a few failures by less experienced students. The courage and self-confidence of the speakers was particularly striking and illustrated how Mr. Hemery's skill and personality had convinced them that they could overcome their disability. All the speakers told of definite improvement achieved through recognition of basically faulty speech methods and progressive re-education in proper use of the vocal apparatus. Diagnosis of speech errors and early training are conducted individually, but speaking before others from the earliest possible stage of treatment is an essential part of the re-education course. The course has no set length, but most stammerers with an established pattern of stammer are said to require up to two years' re-education.

There will be an informal demonstration of impromptu speaking by members of the class on May 18 at 6 P.M., at Goldsmiths' College, and the next public symposium will be held on June 27 at 6.30 P.M.

TWO VALUABLE PAMPHLETS

Two pamphlets by Dr. Edward Glover—one on homosexuality [6] and the other on prostitution [7]—deserve wide circulation. That on homosexuality includes humane and intelligent comments on the present state of affairs, and also a good deal of original fact from the records of the Portman Clinic and from the results of circulating a questionary. The Home Office committee to which this evidence was presented must have found it a refreshing spring of factual information in a wilderness of undocumented opinion. Dr. Glover has the courage to stress the foundations of the current public estimate of homosexuality in ignorance and psychopathology, and to point out the origins of the persecution directed at supposed "perverts" by people overreacting to homosexual components in their own make-up. He refuses to compromise by acquiescing in the demand for "treatment instead of punishment" in cases where there is neither disease nor crime. His careful though brief account of the persons and practices involved, from about 100 case-records, does much to explode the idea that there is any sharp division between "homosexuals" on the one hand and non-homosexual individuals on the other.

Dr. Glover's discussion of prostitution, here in its 2nd edition, is equally humane, though slightly harder to read. His account of the defects of personality which lead women to become prostitutes will meet few objectors if it is applied wholly to our own society and period; but the institution has wide roots, and its form and personnel have varied widely—it seems doubtful whether Dr. Glover's conclusions would have applied to the colleagues of Rahab, to ancient India, or even to modern France or China. This cultural aspect is important, for we are perhaps, on the evidence of history, more likely to be able to transform prostitution than to abolish it.

4. See *Lancet*, 1956, ii, 1056.
5. See *Ibid*, p. 1221.
6. The Problem of Homosexuality. By EDWARD GLOVER, M.D., LL.D. Published by the Institute for the Scientific Treatment of Delinquency, 8, Bourdon Street, Davies Street, London, W.1. Pp. 40. 3*s*.
7. The Psychopathology of Prostitution. London: Institute for the Scientific Treatment of Delinquency. Pp. 20. 1*s*. 6*d*.

RECRUITMENT OF NURSES AND MIDWIVES

FROM May 1, some of the functions of the Ministry of Labour and National Service for the recruitment of nurses and midwives will be transferred to the Ministry of Health and the Department of Health for Scotland. The National Advisory Council on the Recruitment of Nurses and Midwives, which has hitherto advised the Minister of Labour and National Service, will be reconstituted and will henceforth advise the Health Ministers. The Health Ministries will be responsible for the general oversight of recruitment activities and for controlling the use of the mobile nursing exhibitions and the mental-health exhibitions. By agreement with the ministries, regional hospital boards will organise these exhibitions and talks to schools.

The nursing appointments service of the Ministry of Labour and National Service will continue and will provide, through its 166 nursing appointments offices, a placing and advisory service for those who wish to train or work as nurses or midwives. The service will also be available to medical auxiliaries. Regional hospital boards, hospital management committees, local-health authorities, the Services and other employing authorities will, as before, notify their nursing and midwifery vacancies to the nursing appointments offices. The Ministry of Labour will retain the services of their principal nursing officer and a small number of technical nursing officers.

CLEAN BLANKETS

Dr. Blowers and his colleagues [1] have drawn attention to three new types of blanket which may be boiled, and we may hope that such blankets will be introduced in hospitals. But this will take a long time, and meanwhile any economically possible means of making the existing blankets safer will be of interest.

Mr. Leslie Bird, chairman of the laundry subcommittee of the Newcastle Regional Hospital Board, has done some controlled experiments to test an ordinary commercial shrink-resisting process in pure woollen blankets.[2] 12 blankets were treated and 12 not; 6 in each group were washed in commercial and 6 in hospital laundries. They were used normally in the wards between washings. The shrink-resisting process itself led to an inconsiderable loss of size. After 17 washings the untreated blankets had become too short, and after 19 too narrow, to be used. The treated blankets were still extensive enough for use after 60 washings, but had lost weight. They could still be used as extra blankets, and (unlike the untreated blankets) retained their fleecy handle and whiteness.

These findings do not hold for boiling, which inevitably damages woollen blankets, but a low-temperature sterilisation process [3] did not damage the treated blankets. Another interesting finding is that untreated blankets which have shrunk not too badly can be restored to usefulness by stretching while wet, followed by the shrink-resisting process. Mr. Bird estimates that the minimum annual economy if these processes were adopted would be £35 19*s*. per hundred beds.

BRITISH STANDARD FOR HEAVY-DUTY HELMETS

A STANDARD for heavy-duty industrial safety helmets has now been published. A standard for light-duty helmets, chiefly for coalminers, was prepared three years ago. The new standard provides for helmets which will be sufficiently strong to protect the wearer's head from more severe blows. They are intended for use by workers in structural engineering—notably on building-sites, at oil-refineries, in shipbuilding, and in mining and quarrying. While the light-duty standard prescribes a shock-absorption test of 28 ft. lb. the heavy-duty standard prescribes a test of 40 ft. lb. Helmets to the new standard will be heavier and will cost more than the light-duty variety. Employers should consult helmet-makers as to which kind their employees need to wear. Copies of this standard (4*s*. each) may be obtained from the British Standards Institution, sales branch, 2, Park Street, London, W.1.

1. Blowers, R., Potter, J., Wallace, K. R. *Lancet*, March 23, 1957, p. 629.
2. Report on Shrinkage of Woollen Blankets. Newcastle Regional Hospital Board, Benfield Road, Newcastle upon Tyne, 6. 1957.
3. Blowers, R., Wallace, K. R. *Lancet*, 1955, i, 1250.

University of Liverpool

Dr. Phillip Pinkerton has been appointed lecturer in child psychiatry.

Royal College of Surgeons of England

At a meeting of the council on April 11, with Sir Harry Platt, the president, in the chair, Sir Arthur Sims was admitted to the honorary fellowship of the college. Mr. A. C. McEachern (Adelaide) was admitted as a temporary member of the court of examiners. The following were elected fellows of the college without examination as being medical practitioners of at least 20 years' standing:

Mr. G. F. Burnell (Truro), Prof. P. K. Chanmugam (Colombo), Mr. R. F. Guymer (London School of Hygiene and Tropical Medicine), Mr. G. G. Lyttle (Belfast), Surgeon Vice-Admiral R. C. May (medical director-general of the Navy), Colonel J. M. Shah (Karachi).

Jacksonian prizes for 1956 were awarded to Mr. A. H. Hunt (St. Bartholomew's) and Mr. J. A. McCredie (Belfast) for their essays on portal hypertension and Mr. R. E. Horton (Bristol) was awarded a certificate of honourable mention. The council selected as the subject for the Jacksonian prize for 1958 "Factors which influence the genesis and progression of cancer, and their bearing on the surgical treatment of the disease." The Hallett prize was presented to Dr. S. K. Nair (Agra University).

The title of Bland-Sutton lecturer was given to Dr. Frank Stansfield, senior lecturer in anatomy, Royal College of Surgeons of England.

Diplomas were granted, jointly with the Royal College of Physicians, to the following:

D.C.H.—I. M. Adamson, Bhisham Kumar Ahuja, Nimat Jabir Al-Chokhachi, Patricia M. Alexander, Syed Mahmood Al-Kudcy, Ursula M. Anderson, Kamar Jehan Ansari, Khwaja Mukhtar Mahmood Ansari, L. P. Balfour-Lynn, Pinaki Bandyopadhyaya, J. F. X. Bastiampillai, Esther B. Bevan, May Blythe, Shirley P. A. Borkowf, N. L. S. Bourchier, W. H. Brockett, C. W. Brookes, Rusi Jehangir Buhariwalla, Alison G. Carlisle, Nirmal Kumar Chanda, Aileen P. Cherry, Daphne G. Chesshire, Sau-Lan L. Cheung, T. A. Daly, G. J. Davies, T. C. Dennison, Gurtej Singh Dhaliwal, Doreen J. Dicks, Kali Prakash Dikshit, Jean E. Drake, P. G. Drummond-Smith, Ma Tin E, F. P. Frankel, J. D. Frankish, H. J. Fredericks, Puranmal Ganeriwala, Adi Jamshed Gazder, Grace M. Gee, A. G. Giddins, Marianne A. Glesinger, Elton Goldblatt, Vishnu Kumar Gupta, R. D. Haigh, Daphne J. Hall, Hock Thye Heah, B. E. Heine, Margaret J. Hicks, Siew-Ting Hiew, F. K. M. Hillenbrand, F. T.-C. Hu, M. C. J. Hunt, Mohammed Farooq Husain, Cecile Ibrahim, Kathleen A. Irvine, H. J. P. Jayalath, E. E. Jones, Jaswant Singh Kalsi, Saroj Kapur, Pensri Khanjanasthiti, G. S. T. Khoo, Eleanor C. Knox, J. S. Kothiwal, Joan M. Leeming, J. F. Leeton, R. L. Lindon, Barbara Lobo, Derrick Lonsdale, Kathleen M. Lumb, Jean Y. MacDougall, Agnes M. Maclean, Pran Nath Mehrotra, Barbara P. P. Melhuish, Inez R. Mendelson, Audrey Millar, C. J. Morgan, Kornkitch Mutirangura, Elizabeth C. Nelson, P. G. Newall-Watson, Pauline A. Nock, Nalinee V. Odak, Madhukar Manohar Pandit, Ranbir Singh Parmar, Margaret P. Paterson, Monica B. Pool, Bhoom Raj Pratap, Krishna Rao Purohit, C. R. Rainier-Pope, Ian Ramage, Pratap Narain Rastogi, M. J. Ree, Kathleen M. Robb, D. K. Robinson, W. G. Roper, Miro Albert Sasson, Narinder Singh Satija, Werner Heinrich Schutt, Jane M. Semmens, Bimal Chandra Sen, Roop Kishore Seth, Leonard Sinclair, J. J. Slome, Mary N. Smith, Mahalekshmi Thangam Sushila, R. N. P. Sutton, Sara Syrop, I. G. Tait, Om Parkash Thaman, Ann Thompson, J. A. R. Tibbles, S. M. Tucker, Naomi Turner, Marian A. Veitch, Lucy A. Wagstaff, Alison S. Wallace, I. R. Wallace, Ravindra Gopaldas Wani, G. H. Warrick, D. T. Weerawardene, Jean B. Wickings, Joan V. Willcock, A. R. Williamson, R. G. B. Willis, Mary B. Woodfield, Joyce O. Yates.

D.O.—Premasingha Attygalle Abeyaratne, James Abraham, J. E. Ball, C. J. Benson, Rusi Dinshaw Billimoria, T. J. A. Casey, Ivan Cher, N. J. G. Chouler, B. G. Dias, Mustafa El Sayed, R. F. Fisher, D. C. Gibbs, Abdel Gadir Ginawi, Vasudeo Laxmanrao Gokhale, Abdullahi Sid Ahmed Gorcish, P. A. Johnson, Theo Keldoulis, Tajuddin Hasan Kirmani, G. M. Krolman, H. F. Lake, V. J. Marmion, H. H. Massie, Maung Maw, F. S. Owen, R. A. Owen, Irineos Papadopoulos, Ramachandra Pararajasegaram, C. S. L. Peiris, Mohammed Hasan Rizvi, Leslie Rose, Om Prakash Sabharwal, Bhagwan Dayal Shrivastava, Keshmahinder Singh, S. H. Swift, S. V. Thambar, L. J. Topham, F. L. A. Townshend, Dhara Venkateswarlu, Vera M. Vodden, Olga Voloshin, Jamshed Hormuzshaw Wania, Brian Waters, William Wilson.

D.T.M. & H.—Mirghani Yousif Ali, Thevapiriam Rajasekaram Arulambalam, Sudhindra Nath Basu, Giorgio Battaglia, R. C. Braun, Ponnuthury Brodie, Tarak Das Chatterjee, Dorasamy Chetty, Arjan Chopra, Ram Karan Chopra, J. A. Cooney, Gourshankar Lal Das, Sambhu Nath Dutta, Mohamad Ali Faghih, P. D. Farjo, R. O. J. Fry, Paul Gretch, Dhanindra Nath Guha Majumder, A. B. C. Hotobah During, Valiyezhuth Krishnankutty Jayaram, Ko Ko, Hira Lal, Nigamuni Mervyn Piyasena Mendis, Vinod Ratilal Mody, Abdul Salam Mohamed, P. R. H. Molesworth, Duraiswamy Aiyar Narasimhan, Nur-Ud-Din, G. G. Prinsell, Abdul Hafeez Qureshi, Phyllida M. M. Roberts, Yelahanka Patlamma Rudrappa, Nabendu Kumar Sarker, M. G. Schmiedel, Venkatanarayana Balasa Setty, Mahendra Prasad Shaw, Muthummah Simmappu, K. G. Somers-Dehaney, Tin U, Francesco Vitanza, Helena T. von Schantz, Wan Yam Mow, D. S. P. S. V. J. Wijesekera, Yao-Tsing Wu.

D.Phys. Med.—V. C. De Silva, Charlotte Feldman, S. A. James, B. W. Norington.

D.A.—J. E. S. Relton.

D.M.R.D.—K. M. Nuttall.

University of Dublin

Dr. Frank B. Walsh, associate professor of ophthalmology in Johns Hopkins University, Baltimore, will deliver the Montgomery lecture on Friday, May 17, at 5 P.M. He is to speak on ocular movements associated with regeneration of the third nerve. Prof. Adolph H. Schultz, director of the anthropological institute of the University of Zürich, will deliver the John Mallet Purser lecture on Tuesday, May 21, at 4.30 P.M. His subject is to be Past and Present Views of Man's Specialisations. Both lectures will be given at Trinity College.

National University of Ireland

Mr. Seaghan O'Beirn has been appointed to the professorship of surgery at University College, Galway.

Prof. Edward Keenan has been coöpted a member of the senate in place of the late Prof. John McGrath.

Royal College of Physicians of Ireland

On April 5, the following were admitted to the licence of medicine and midwifery of the college:

A. S. A. Atchia, Beryl D. Chalkley, S. P. J. Halpin, R. W. Kneafsey, M. B. Labode, G. K. Maghraji, S. V. McAndrew, A. G. McInerney, H. J. O'Brien, C. P. Quinn, A. C. Walsh.

British Association

This year the association will meet in Dublin from Sept. 4 to 11 under the presidency of Prof. P. M. S. Blackett, F.R.S.

International Congress of Group Psychotherapy

This congress will be held in Zürich from Aug. 29 to 31. Further particulars may be had from Dr. Adolf Guggenbuhl-Craig, Lenggstrasse 28, Zürich 8, Switzerland.

Assurance Medical Society

A meeting of this society will be held at 5 P.M. on Wednesday, May 1, at 11, Chandos Street, London, W.1, when Dr. A. H. Douthwaite will speak on some dangers of therapeusis.

Death Grant

The time allowed for claiming a death grant under the National Insurance scheme has been extended from three months to six months.

Central Midwives Board

Mr. Arnold Walker has been re-elected chairman of the board, and Prof. A. A. Moncrieff deputy chairman, for the coming year.

Chalmers Medal

The council of the Royal Society for Tropical Medicine and Hygiene have awarded this medal for 1957 to Dr. A. J. Haddow, director of the Virus Research Institute, Entebbe, Uganda.

National Society of Children's Nurseries

The annual general meeting of this society will be held on Thursday, May 30, at 4 P.M. at 45, Russell Square, London, W.C.1. At 4.30 P.M. Prof. W. S. Walton will give an address on Mothers at Work.

Indian Medical Service Dinner Club

The annual dinner of this club will be held at the East India and Sports Club Ltd., St. James's Square, London, S.W.1, on Friday, June 7 at 7.30 P.M. Tickets may be had from the secretary of the club, Medical Board Room, Commonwealth Relations Office, Matthew Parker Street, S.W.1.

Collegium Internationale Allergicologicum

The following officers have been elected for 1957–58:

President, Dr. David Harley; vice-president, Dr. J. Duchaine, Brussels; hon. secretary, Dr. P. Kallós, Helsingborg; treasurer and executive secretary, Dr. A. Cerletti, Basle.

Other members of council include Dr. R. R. A. Coombs and Dr. W. S. Feldberg, F.R.S.

Prof. A. C. Frazer has been appointed a member of the food panel of the World Health Organisation.

A travelling scholarship fund has been founded by Sir Edward and Lady Baron to enable junior members of the staff of the corneoplastic unit and regional eye bank, Queen Victoria Hospital, East Grinstead, to visit foreign clinics, and to continue their studies of the joint problems of plastic and ophthalmic surgery.

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Academic and Educational

UNIVERSITY OF BRISTOL

A POSTGRADUATE COURSE in preparation for the CONJOINT DIPLOMA OF CHILD HEALTH will be held from OCTOBER to DECEMBER, 1957. (Provided that sufficient applications are received by 29th June.) Fee 20 guineas.

FACULTY OF ANÆSTHETISTS
ROYAL COLLEGE OF SURGEONS OF ENGLAND
Lincoln's Inn-fields, London, W.C.2

PHARMACOLOGY LECTURE COURSE

A 2 weeks' course of lectures in Pharmacology will be held from 13TH to 24TH MAY, 1957, for postgraduates preparing for higher Diplomas in Anæsthetics. Fee £6 6s.

Further details may be obtained from Mr. W. F. DAVIS, Secretary, Faculty of Anæsthetists, Royal College of Surgeons of England, Lincoln's Inn-fields, London, W.C.2 (Tel.: HOLborn 3474).

FACULTY OF ANÆSTHETISTS
ROYAL COLLEGE OF SURGEONS OF ENGLAND
Lincoln's Inn-fields, London, W.C.2

ANÆSTHETIC COURSE

A 2 weeks' course of lectures, clinical conferences and tutorials for postgraduates preparing for higher Diplomas in Anæsthetics will be held from 17TH to 28TH JUNE, 1957.

Fees: Lectures £12 12s.
Clinical Conferences £2 2s.
Tutorial Groups £10 10s.

Applications cannot be accepted for the Clinical Conferences or Tutorial Discussion Groups only. These must be taken in conjunction with the Lecture Course.

Further details may be obtained from Mr. W. F. DAVIS, Secretary, Faculty of Anæsthetists, Royal College of Surgeons of England, Lincoln's Inn-fields, London, W.C.2 (Tel.: HOLborn 3474).

THE HOSPITAL FOR SICK CHILDREN
TORONTO, CANADA

RESEARCH FELLOWSHIP IN BACTERIOLOGY

Applications invited from medical graduates (Male or Female) with training in bacteriological methods and some interest in pædiatrics. Duties will consist chiefly of laboratory investigation of problems relating to bacterial infections. Some training in immunology or immuno-chemistry would be helpful but not essential. To start 1ST SEPTEMBER, 1957. Salary $5750. Preference given to person prepared to remain for a 2-year period.

Applications, with names and addresses of 2 referees, to be sent air-mail to Director of Research Institute, The Hospital for Sick Children, Toronto, Canada.

ROYAL VICTORIA INFIRMARY, Newcastle upon Tyne, 1

CLINICAL MEETINGS, DEPARTMENT OF MEDICINE

The Department of Medicine, Royal Victoria Infirmary, is holding a series of weekly clinical meetings on THURSDAYS at 5.15 P.M., from 2ND MAY to 27TH JUNE (inclusive). These will take place in the New Lecture Theatre at the Infirmary and will consist of the presentation of cases followed by open discussion.

The meetings are open to any medical practitioner who wishes to attend.

NAPT

SYMPOSIUM ON CHRONIC BRONCHITIS, WEDNESDAY, 29TH MAY, 1957, 3.30–6.30 P.M., Clinical Science Building, York-place, Manchester.

Admission by ticket only, 10s. each (including afternoon tea and sherry), from National Association for the Prevention of Tuberculosis, Tavistock House North, London, W.C.1.

THE UNIVERSITY OF LIVERPOOL. Department of OBSTETRICS AND GYNÆCOLOGY. Applications are invited for the whole-time post of TUTOR IN OBSTETRICS, resident in Mill Road Maternity Hospital. Previous resident experience in obstetrics and gynæcology is essential and higher qualifications in these subjects are desirable. The appointment will be for 1 year in the first instance, commencing as soon as can be arranged with the successful candidate. The salary, based on the current salary scheme which is under revision, will be within the range £600–£1200 p.a., according to qualifications and experience, together with board-residence.

Applications, stating age, qualifications and experience, together with the names of 3 referees, should be received not later than 29th April, 1957, by the undersigned, from whom further particulars of the conditions of the appointment may be obtained. STANLEY DUMBELL, Registrar.

THE UNIVERSITY OF SHEFFIELD. Applications are invited for a post of SENIOR LECTURER or LECTURER IN MEDICINE to begin duties on 1st July, 1957, or as soon thereafter as possible. Present salary scales: Senior Lecturer, £1800–£100–£2400; Lecturer, £1000–£100–£1700, with F.S.S.U. provision and family allowance. (New scales are expected to be introduced on 1st August, 1957, as follows: Senior Lecturer, £1950–£100–£2550; Lecturer, £1200–£100–£1900.) Initial salary according to qualifications and experience.

Further particulars should be obtained from the Registrar to whom applications (10 copies) should be sent by 11th May, 1957.

UNIVERSITY OF LONDON. The Senate invite applications for the READERSHIP IN ANATOMY tenable at the London Hospital Medical College (salary within the range £1450–£2050 a year).

Applications (10 copies) must be received not later than 27th May, 1957, by the Academic Registrar, University of London, Senate House, W.C.1, from whom further particulars may be obtained.

UNIVERSITY OF LONDON. The Senate invite applications for the READERSHIP IN SURGERY tenable at London Hospital Medical College (salary within the range £1900–£2400 a year).

Applications (10 copies) must be received not later than 22nd May, 1957, by the Academic Registrar, University of London, Senate House, W.C.1, from whom further particulars may be obtained.

UNIVERSITY OF BRISTOL. The University invites applications for the post of LECTURER IN MEDICINE. Salary £1200–£1750 p.a. according to qualifications and experience, together with superannuation and children's allowances. The successful candidate will be appointed a Senior Registrar to the United Bristol Hospitals during his tenure of the Lectureship, and will be required to enter into an honorary contract with the Board of Governors.

Applications, stating age, qualifications and experience, should include the names of 3 referees and should reach the Registrar, from whom further particulars may be obtained, not later than 3 weeks from the date of the appearance of this advertisement.

THE UNIVERSITY OF ALBERTA invites applications for the position of ASSOCIATE PROFESSOR OF PSYCHIATRY at a salary of $8500 per year, plus pension plan and limited consulting privileges. Duties to include teaching of medical students, a programme of research, and clinical consultation.

Applications should include a recent photograph, a curriculum vitae, and the names of 3 referees, and should be sent to the Dean of Medicine, University, Edmonton, Alberta, Canada.

Hospital Services: Senior Appointments

BIRMINGHAM REGIONAL HOSPITAL BOARD. CONSULTANT ANÆSTHETISTS.

(*a*) Whole-time. Duties mainly at Selly Oak Hospital.

(*b*) Part-time (9 notional half-days weekly). Duties mainly at Guest Hospital, Dudley (154 Beds); also at Wordsley Hospital (372 Beds) and Corbett Hospital (106 Beds), Stourbridge.

(*c*) Part-time (8 notional half-days weekly). Duties at Wordsley Hospital (6 notional half-days) and Corbett Hospital (2 notional half-days).

(*d*) Part-time (8 notional half-days weekly). Duties at Sutton Coldfield (3 notional half-days), Tamworth (3 notional half-days), Victoria (1 notional half-day), and Hammerwich (1 notional half-day) Hospitals, Lichfield.

All posts experience specialty and D.A. (Parts I and II) or F.F.A.R.C.S. required.

Applications (15 copies), stating name, age, nationality, qualifications, present and previous appointments, and details of 3 referees, to Secretary, 10, Augustus-road, Birmingham, 15, by 20th May, 1957.

CHICHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Locum ANÆSTHETIST (5 half-days per week) required pending substantive Consultant appointment. Consultant, Senior Hospital Medical Officer, or Senior Registrar's remuneration according to grading of successful applicant. Group covers Royal West Sussex and St. Richard's Hospitals, Chichester, Bognor Hospital, and Midhurst and Petworth Hospitals.

Inquire of Group Secretary, 174, Broyle-road, Chichester.

LEEDS REGIONAL HOSPITAL BOARD. Applications are invited from medical practitioners for the appointment of REGIONAL PSYCHIATRIST. The person appointed will be employed for 7/11ths of his time on administrative duties on the staff of the Senior Administrative Medical Officer at the Board's Headquarters, Harrogate (salary scale, Whole-time, £2300–£2875 p.a.) and for 4/11ths of his time on Consultant clinical work (salary scale, Whole-time, £2100–£3100 p.a.). The proportion of time spent on administrative and clinical duties will be subject to review from time to time. It is hoped that arrangements will be made for the successful candidate to work in association with the Leeds University Department of Psychiatry for at least 1 session per week. Candidates should hold high qualifications in medicine and psychiatry and have wide experience in general psychiatry, including administrative experience of both inpatient and outpatient work.

Applications, with full details of qualifications and experience, together with the names of 3 referees, to be sent to the Secretary, Park-parade, Harrogate, by 10th May, 1957.

LIVERPOOL REGIONAL HOSPITAL BOARD. Regional CARDIOLOGICAL CENTRE. Applications are invited for the post of Part-time CONSULTANT PHYSICIAN for Cardiology giving 7 notional half-days weekly at the above Centre situated at Sefton General Hospital. The person appointed will work under the general direction of the Director and Deputy Director of the Regional Cardiological Centre. Applicants must possess the M.R.C.P. and have considerable experience in modern methods of diagnosis and treatment of cardiological conditions.

Forms of application from Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be returned not later than 11th May, 1957.

VINCENT COLLINGE, Secretary to the Board.

NEWCASTLE REGIONAL HOSPITAL BOARD. Applications are invited for the post of ADMINISTRATIVE MEDICAL OFFICER on the staff of the Senior Administrative Medical Officer at the Board's headquarters. Salary £1415–£50 (4)–£65 (1)–£1680 (below age 33, the salary is £1275–£1375, linked to age). Previous administrative experience not essential; facilities for training will be provided by secondment and otherwise. Subject to Whitley Council conditions of service and the National Health Service superannuation regulations.

Applications, with full particulars and names and addresses of 3 referees, to the Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 28 days.

MANCHESTER REGIONAL HOSPITAL BOARD. Whole-time SENIOR CASUALTY OFFICER at Preston Royal Infirmary—resident or non-resident. Appointee will work under general supervision of Consultants. Tenure of post limited to 4 years; salary within range £1575–£50–£2025, according to experience, &c.

Application forms, from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by 6th May, 1957.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) CONSULTANT PATHOLOGIST with special interest in bacteriology, whole-time or maximum sessions, Ashford Hospital, Ashford, Middlesex (562 Beds).

Applications before 20th May, 1957.

(2) CONSULTANT GERIATRICIAN (whole-time or maximum sessions), Uxbridge and Staines Groups. The successful applicant will, for at least 2 years, devote 3 or 4 sessions a week to Ashford Hospital, Ashford, Middlesex, and the remainder of the time to the Uxbridge Group (Hillingdon and St. John's Hospitals). There are approximately 170 chronic sick beds between the 2 Groups and the number is likely to increase.

Applications before 29th May, 1957.

(3) ASSISTANT CHILD PSYCHIATRIST (Senior Hospital Medical Officer grade), 2 half-days a week (1 day) Hertfordshire Child Guidance Service. Candidates may visit by appointment with the Medical Director, Child Guidance Clinic, Hill End, St. Albans.

Applications before 27th May, 1957.

Application forms obtainable from, and returnable to, Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

OXFORD REGIONAL HOSPITAL BOARD. Consultant PHYSICIAN in Geriatrics (whole-time or maximum part-time) to the Hospitals of the Reading Area. The Geriatric Services are based on Battle Hospital, Reading (172 Beds), and out-patient clinics, with 4 peripheral units (340 Beds).

Applications (12 copies), stating age, qualifications, experience and the names of 3 referees, should reach the Secretary, 43, Banbury-road, Oxford, by 13th May, 1957.

SHEFFIELD REGIONAL HOSPITAL BOARD. CONSULTANT ORTHOPÆDIC SURGEON (maximum part-time) required for Harlow Wood Orthopædic Hospital, near Mansfield, and associated clinics.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 18th May, 1957.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time CONSULTANT PSYCHIATRIST required to be designated Medical Superintendent of Balderton Hospital, near Newark, a new hospital (approximately 800 Beds) for all grades of mental defectives, the first part of which (282 Beds) will be ready for occupation in July next. A house is now being built for the Medical Superintendent.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 18th May, 1957.

NEW ZEALAND. THE OTAGO HOSPITAL BOARD. MEDICAL UNIT, DUNEDIN HOSPITAL, AND UNIVERSITY OF OTAGO. SENIOR ASSISTANT on the Clinical and Teaching Staff.

Applications are invited for the position of Senior Assistant on the Medical Unit, Dunedin Hospital, and University of Otago from persons holding a Degree in Medicine of an approved University and who either :—

(*a*) Hold a higher qualification and have had 2 or more years practical experience in medicine.

(*b*) Have been qualified for 6 years or more and have had 3 years or more practical experience in medicine.

The Senior Assistant ranks as Lecturer or Senior Lecturer in Medicine and as a Junior Specialist and the salary payable is that under the Hospital Employment (Medical Officers) Regulations, viz. : £1600–£1900. The commencing rate of salary within the scale, will be that determined by the Medical Officers' Salaries Grading Committee in accordance with the qualifications and experience of the appointee.

Applicants should have a good background in medicine. The position is non-resident, is full-time and private practice is not permitted.

Conditions of appointment and application forms may be obtained from the Office of the High Commissioner for New Zealand, 415, Strand, London. Travelling expenses will be paid in accordance with the table set out in the conditions of appointment.

Applications, stating age, qualifications and experience, together with Health and Radiological Certificates and testimonials, will be received by the undersigned up to 10 A.M. on Monday, 27th May, 1957.

W. A. WILLIAMSON, Secretary, Otago Hospital Board.
P.O. Box 946, Dunedin, New Zealand.

NEW ZEALAND. ROTORUA HOSPITAL, Rotorua, NEW ZEALAND. Applications are invited from suitably qualified medical practitioners of the British Empire for the position of SURGEON at the above Hospital. Preference will be given to applicants possessing postgraduate degrees. Salary in accordance with the Hospital Employment (Medical Officers) Regulations as Junior Specialist £NZ1600–£NZ1900 (non-resident) the commencing rate within this scale to be determined by the Medical Officers' Salaries Grading Committee. An allowance will be paid on arrival, towards travelling expenses incurred, in travelling to take up appointment.

Conditions of appointment and form of application, are available from the office of the High Commissioner for New Zealand, 415, Strand, London, W.C.2. Applications close with the Secretary, Waikato Hospital Board, P.O. Box 934, Hamilton, New Zealand, on 28th June, 1957.

A. C. BURGESS, Secretary.

IBADAN, NIGERIA. UNIVERSITY COLLEGE HOSPITAL. The Board of Management invite applications from registered medical practitioners for the new post of SENIOR HOSPITAL MEDICAL OFFICER responsible for the organisation and maintenance of a Blood Transfusion Service in the Hospital.

Candidates should have had experience in Laboratory work including work in a Hæmatological Laboratory carrying out blood transfusion procedures.

The department is in the recently completed teaching hospital and is at present part of the Department of Pathology. It is hoped that, in due course, blood-transfusion will become an independent hospital department.

The salary offered for the post is £1482 p.a. rising by 5 annual increments to a maximum of £1788 p.a. In addition, an expatriate doctor will be granted an inducement allowance of £300 p.a.

The appointment will be initially for 2 tours of 12–18 months and will be renewable by mutual agreement, for a further tour.

On satisfactory completion of service a gratuity of £37 10s. will be paid for each completed term of 3 months service.

An outfit allowance of £60 is payable on first appointment.

Partly furnished quarters are provided at a rental of 8⅓% of salary excluding inducement allowance, and an expatriate doctor appointed will be eligible for 7 days leave on full pay for each completed month of service in Nigeria. A Nigerian doctor will be eligible for 5 days leave for each completed month.

Free first-class passages are provided for expatriate doctors and their wives on first appointment, on vacation leave and on completion of their agreement. Free first-class passages to Nigeria will, in certain circumstances, be provided for Nigerian doctors.

Arrangements can be made to enable doctors to continue their National Health Service superannuation scheme contributions and details of the revised salary and gratuity payable in such cases will accompany application forms.

Application forms should be submitted not later than 4th May, 1957, on the appropriate forms which will be forwarded together with additional information on receipt of an addressed foolscap envelope by the Adviser on Staff Recruitment, London Office, University College Hospital, Ibadan, 57, Catherine-place, Palace-street, London, S.W.1.

Hospital Services : Junior Appointments

BETHLEM ROYAL HOSPITAL AND THE MAUDSLEY HOSPITAL. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER for the period from 1st July, 1957, to 7th October, 1958, at the above Postgraduate Teaching Hospital, with which is associated the Institute of Psychiatry (University of London). Experience in general medicine and neurology or in the basic sciences is an advantage.

Applications, giving details of experience and the names of 2 referees, should be made within 1 week of the appearance of this advertisement. Application forms obtainable from K. J. JOHNSON, House Governor and Secretary, Maudsley Hospital, Denmark-hill, S.E.5.

BETHNAL GREEN HOSPITAL, Cambridge Heath-road, E.2. HOUSE SURGEON (pre-registration) required.

Applications, stating experience and 2 testimonials, to Hospital Secretary.

BROOK GENERAL HOSPITAL, Shooters Hill, Woolwich, S.E.18. SENIOR HOUSE OFFICER (Infectious Diseases Unit), vacant early May. This Unit provides excellent experience and is one of the Regional Centres for the treatment of bulbar poliomyelitis. The appointment will include pædiatrics when a new ward is opened shortly.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

BROMPTON HOSPITAL, S.W.3. Applications invited for post of SURGICAL REGISTRAR (whole-time). The appointment is for 1 year with eligibility for reappointment. Candidates must hold the Diploma of F.R.C.S.

Applications, stating age, qualifications with dates, nationality, and appointments held, together with copies of testimonials, by 4th May, 1957, to KENNETH A. F. MILES, House Governor.

BATTERSEA GENERAL HOSPITAL, Battersea Park, S.W.11. CASUALTY OFFICER. Residence optional. House Officer or Senior House Officer grade according to experience. Vacant 11th May, 1957. Not recognised for F.R.C.S.

Apply Hospital Secretary, enclosing copies of 2 recent testimonials.

BOLINGBROKE HOSPITAL, Wandsworth Common, London, S.W.11. Locum SURGICAL REGISTRAR (resident) 22nd–29th April, 1957, inclusive.

Apply Hospital Secretary.

DREADNOUGHT SEAMEN'S HOSPITAL, Greenwich, S.E.10. HOUSE PHYSICIAN (pre-registration) required on 21st May.

Applications, stating age, nationality, qualifications and experience, with the names of 3 recent referees, should be sent to the Secretary at the above address not later than 6th May.

EASTMAN DENTAL HOSPITAL AND INSTITUTE OF DENTAL SURGERY (UNIVERSITY OF LONDON), Gray's Inn-road, W.C.1. Applications are invited for the full-time post of ANÆSTHETIST in the grade of Registrar, commencing 29th July, 1957. Remuneration and conditions of service in accordance with national scale.

Application forms are obtainable from the Director to whom they should be returned by 6th May, 1957.

FOREST GATE HOSPITAL, Forest-lane, E.7. Pre-registration OBSTETRIC HOUSE OFFICER (second post) required for 6 months commencing 1st June, 1957. The appointment is recognised for training candidates for D.Obst.R.C.O.G.

Applications, with names of 2 referees, to Hospital Secretary by 27th April, 1957.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from pre-registration and registered Women medical practitioners for the post of FIRST HOUSE SURGEON, with charge of general surgical beds. Appointment for 6 months from 1st June, 1957. Salary according to Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 24th April, 1957.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from pre-registration and registered Women medical practitioners for the post of SECOND HOUSE PHYSICIAN. Appointment for 6 months from 1st June, 1957. Salary according to Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 24th April, 1957.

QUY'S HOSPITAL, S.E.1. Applications are invited for the post of TRAINEE REGISTRAR in Diagnostic Radiology. Applicants should hold a higher qualification in medicine or surgery. The holder of this post will be remunerated at the rate for the grade of Registrar. Duties commence 1st October, 1957, with appointment for 2 years, subject to review at the end of the first year, during which time the holder will be expected and given the opportunity to obtain a radiological qualification.

Forms of application are obtainable from, and should be lodged with, the Superintendent, Guy's Hospital, S.E.1, not later than 13th May, 1957.

GUY'S HOSPITAL AND SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited to fill the following established vacancies for SENIOR REGISTRARS to the Board of Governors of Guy's Hospital and the South East Metropolitan Regional Hospital Board. They will be expected to spend a minimum of 1 and not more than 2 years in a Regional Board Hospital, in the Group as stated, on an exchange basis during a 4-year tenure of the post. The appointments will be made jointly by the bodies concerned and will be held in the first instance at Guy's Hospital. The posts, which will be reviewed annually, are subject to the terms and conditions of service of hospital medical and dental staffs (England and Wales) with duties commencing on 1st October, 1957.

General Medicine—Bromley Group.
General Surgery—Bermondsey and Southwark Group.
E.N.T. Surgery—Bromley Group.

Forms of application are obtainable from, and should be lodged with, the Superintendent, Guy's Hospital, S.E.1, not later than 13th May, 1957.

HACKNEY HOSPITAL, London, E.9. (General—841 Beds.) Applications are invited for the resident appointment of SENIOR HOUSE OFFICER (orthopædics) (post vacant 13th May) and should reach the Secretary above address by 3rd May, quoting HH/SHO/O.

HOSPITALS FOR DISEASES OF THE CHEST. Applications invited for post of SENIOR SURGICAL REGISTRAR (whole-time). The appointment is for 1 year with eligibility for reappointment and will involve duties within the Group. Candidates must hold the Diploma of F.R.C.S.

Applications, stating age, qualifications with dates, nationality and appointments held, together with copies of testimonials, by 6th May, 1957, to—

KENNETH A. F. MILES, Secretary to the Board.
Brompton Hospital, London, S.W.3.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, London, N.W.8. Applications are invited from pre-registration or registered medical practitioners (Male) for the appointment of HOUSE SURGEON, to become vacant on 29th May, 1957. This post is recognised for purposes of the F.R.C.S. (Eng.). Appointment will be for a period of 6 months. National Health Service salary.

Applications should reach the Secretary on or before Monday, 29th April, 1957, together with copies of 3 recent testimonials.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, London, N.W.8. Applications are invited from pre-registration or registered medical practitioners (Male) for the appointment of HOUSE SURGEON to the Midwifery and Gynæcological Departments, to become vacant on 3rd June, 1957. Appointment will be for a period of 6 months. National Health Service salary.

Applications to reach the Secretary on or before Monday, 29th April, 1957, together with copies of 3 recent testimonials.

MILE END HOSPITAL, Bancroft-road, London, E.1. (484 Beds.) HOUSE PHYSICIAN (pre- or post-registration). Post vacant 20th May, 1957.

Application forms, obtainable from Physician-Superintendent, to be returned by 3rd May, 1957, with copies of not more than 3 testimonials.

NELSON HOSPITAL, Kingston-road, Merton, S.W.20. HOUSE SURGEON (resident), vacant now. Post recognised for F.R.C.S.

Applications, stating age, qualifications, &c., with the names and addresses of 2 referees, to be sent to Secretary at above address.

NELSON HOSPITAL, Kingston-road, Merton, S.W.20. RESIDENT ANÆSTHETIST (Senior House Officer grade). Post approved for the D.A. Vacant now.

Applications, stating age, qualifications and experience, with copies of testimonials and the name of 1 referee, should be sent to the Group Secretary, St. Helier Hospital, Carshalton, Surrey.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. RESIDENT HOUSE PHYSICIAN (post-registration) required for 1st June, for 6 months. General medicine.

Applications (in own handwriting), stating age, nationality, qualifications, experience, with copies of recent testimonials, to Secretary of Hospital, by 1st May.

PADDINGTON GENERAL HOSPITAL, Harrow-road, W.9. Applications are invited for the post of SENIOR HOUSE OFFICER (anæsthetics), resident on duty. Recognised for D.A. and F.F.A.R.C.S.

Applications, stating age, qualifications, medical school, experience, together with names and addresses of 2 referees, to reach Hospital Secretary by 30th April, 1957.

PADDINGTON GENERAL HOSPITAL, Harrow-road, W.9. Applications are invited for the undermentioned posts commencing 1st June, 1957. Preference will be given to pre-registration candidates where appropriate :—

2 HOUSE SURGEONS (general surgery), pre-registration posts. Recognised for F.R.C.S.

2 HOUSE SURGEONS (obstetrics and gynæcology), 1 pre-registration post. Both recognised for M.R.C.O.G. in obstetrics.

4 HOUSE PHYSICIANS (general medicine), pre-registration posts.

Applications, stating age, qualifications, medical school, experience, together with names and addresses of 2 referees, to reach Hospital Secretary by 30th April, 1957.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. Applications are invited from qualified medical practitioners for the appointment of RESIDENT JUNIOR HOUSE SURGEON for casualty (pre-registration first or second post) to the above Hospital for a period of 6 months, vacant 27th May, 1957.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, to be returned by 27th April, 1957

PRINCESS BEATRICE HOSPITAL, Earls Court, S.W.5. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SURGICAL REGISTRAR (general surgery), resident.

Application forms from the Group Secretary, St. Luke's Hospital, Sydney-street, Chelsea, S.W.3 (enclose foolscap stamped addressed envelope).

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, E.15. HOUSE SURGEON (Male or Female), House Officer, third post. 6 months commencing as soon as possible. Post recognised for F.R.C.S.

Applications, with the names of 3 referees, to Hospital Secretary by 29th April, 1957.

ROYAL FREE HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR CASUALTY OFFICER at the above Hospital. The appointment is full-time, resident, for 6 months. Duties to commence 1st July, 1957. Salary and conditions of service in accordance with those laid down by the Ministry of Health for Senior House Officers.

Application forms may be obtained from the Secretary, Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 12th May, 1957.

ROYAL FREE HOSPITAL, W.C.1. Applications are invited for the post of SENIOR RESIDENT MEDICAL OFFICER at the above Hospital. Duties, which are for 1 year in the first instance, to commence on 16th June, 1957. Terms and conditions of service in accordance with those laid down by the Ministry of Health for Junior Hospital Medical Officers.

Application forms may be obtained from the Hospital Secretary, Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 15th May, 1957.

ROYAL MARSDEN HOSPITAL, Fulham-road, London, S.W.3. Applications are invited for the post of SURGICAL REGISTRAR (full-time) to begin duty as soon as possible. Appointment for 1 year, eligible for re-election.

Forms of application are obtainable from the House Governor, to whom applications, together with copies of 3 recent testimonials, should be sent, not later than 3rd May, 1957.

ROYAL MARSDEN HOSPITAL, Fulham-road, London, S.W.3. Applications are invited from registered medical practitioners for 2 posts of HOUSE SURGEON (resident). Salary £577 10s. p.a. The posts are tenable for 6 months from 28th June and 1st July respectively.

Forms of application are obtainable from the House Governor, to whom applications, together with copies of 3 recent testimonials, should be sent not later than 3rd May.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, BrockLEY HILL, STANMORE, MIDDLESEX. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (2 vacancies) for a period of 6 months. Duties to commence on 3rd June and 30th June, 1957.

Applications to be received by 10th May, 1957. Forms of application can be obtained from the House Governor at 234, Great Portland-street, London, W.1.

ST. ANN'S GENERAL HOSPITAL, N.15. Applications are invited from registered medical practitioners for the appointment of RESIDENT HOUSE SURGEON (Senior House Officer) to above Hospital for a period of 6 months from 3rd June, 1957.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, to be returned by 30th April, 1957.

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. South WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SURGICAL REGISTRAR (whole-time), non-resident, vacancy 18th July, 1957. Post recognised for F.R.C.S.

Application forms from the Group Secretary, St. Luke's Hospital, Sydney-street, S.W.3, to be returned within 14 days of date of advertisement (enclose foolscap stamped addressed envelope).

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. House PHYSICIAN for duty in Rheumatism Unit, resident. This post offers valuable experience in general medicine and specialised experience in rheumatic and connective tissue diseases. Vacancy early June, 1957.

Applications, naming 2 referees, to Medical Superintendent, within 14 days.

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. House PHYSICIAN (pre-registration), resident, vacancy early June, 1957.

Applications, naming 2 referees, to Medical Superintendent.

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. Pædiatric HOUSE PHYSICIAN (resident), vacancy 13th June, 1957.

Applications, naming 2 referees, to Medical Superintendent within 14 days.

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. House SURGEON (obstetrics and gynæcology), second post, resident, vacancy late May. Post recognised for D.Obst.R.C.O.G.

Applications, naming 2 referees, to be submitted to the Medical Superintendent, within 14 days.

ST. THOMAS'S HOSPITAL, London, S.E.1. Senior REGISTRAR to the Orthopædic Department for a period of 1 year in the first instance.

Applications, naming 2 referees, to the Clerk of the Governors.

ST. THOMAS'S HOSPITAL, London, S.E.1. Surgical REGISTRAR (1 vacancy) for a period of 1 year in the first instance, commencing from 1st August, 1957. There are 4 Surgical Registrar posts at St. Thomas's and in the Group, which are interchangeable, 2 of them being resident and 2 non-resident.

Applications, naming 2 referees, to the Clerk of the Governors by 3rd May, 1957.

ST. THOMAS'S HOSPITAL, London, S.E.1. Resident REGISTRAR to the Department of Anæsthetics for a period of 1 year in the first instance, from 25th June, 1957.

Applications, naming 2 referees, to the Clerk of the Governors by 27th April, 1957.

ST. BARTHOLOMEW'S HOSPITAL, E.C.1, AND NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR REGISTRAR in General Surgery to be held for 2 years at St. Bartholomew's Hospital and 2 years at either Queen Mary's Hospital, Stratford, or Oldchurch Hospital, Romford. The appointment is tenable from 1st May, 1957, or by arrangement and is subject to annual re-election.

Applications (10 copies), together with the names of 3 referees, should be submitted to the undersigned within the next 14 days. C. C. CARUS-WILSON, Clerk to the Governors.

St. Bartholomew's Hospital, London, E.C.1.

ST. JAMES' HOSPITAL, Balham, S.W.12. House Officer for gynæcology and ante-natal clinics required immediately.

Applications, stating age, qualifications, experience and names of 2 referees, to Group Secretary, Wandsworth Hospital Group, at above address. (0192.)

ST. JAMES' HOSPITAL, Balham, S.W.12. Senior House OFFICER (anæsthetics). Post recognised for D.A. and F.F.A.R.C.S. Vacant 24th May.

Applications, stating age, experience, qualifications and names of 2 referees, to Group Secretary, Wandsworth Hospital Group, at above address by 4th May. (0193.)

ST. NICHOLAS HOSPITAL, Plumstead, S.E.18. Senior HOUSE OFFICER (Casualty Department), vacant 1st May. Recognised for F.R.C.S. 6 months resident appointment and may then be renewed for a further period.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

TAVISTOCK CLINIC, 2, Beaumont-street, London, W.1. Applications are invited for the whole-time post of PSYCHIATRIC REGISTRAR commencing 1st September, 1957, in the Department for Children and Parents. The Clinic may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary to Committee, Paddington Group Hospital Management Committee, Harrow-road, W.9, by 6th May.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy on 15th July, 1957, for a RESIDENT ANÆSTHETIST (Senior Registrar).

Full particulars with form of application which must be returned not later than Monday, 13th May, 1957, may be obtained from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. Applications invited for post of SENIOR REGISTRAR or REGISTRAR to E.N.T. Department, for 1 year in first instance from 1st July, 1957.

Applications (9 copies), with names of 2 referees, to House Governor, by 11th May.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. Applications invited for post of SENIOR HOUSE OFFICER to Anæsthetics Department for 1 year. Post vacant from 1st May 1957.

Applications (11 copies), with names of 2 referees, to House Governor by 4th May.

WESTMINSTER CHILDREN'S HOSPITAL. West-MINSTER HOSPITAL TEACHING GROUP. CASUALTY OFFICER required for 6 months from 1st July, 1957. Grade, House Officer (post-registration) or Senior House Officer, dependent on experience.

Applications, with copies of testimonials, should reach the Secretary, Westminster Children's Hospital, Vincent-square, S.W.1, by 4th May.

ASHTON, HYDE AND GLOSSOP HOSPITAL MAN-AGEMENT COMMITTEE. SENIOR HOUSE OFFICER required to assist Consultant Geriatrician in a modern unit which serves the area of the Hospital Management Committee, with main duties at Ashton-under-Lyne General Hospital. There is a full scope for the study of clinical medicine and the post is suitable for a young Physician wishing to work for higher qualifications or interested in social medicine and rehabilitation.

Applications, together with 2 references, to the Group Secretary, General Hospital, Ashton-under-Lyne, Lancs.

ASHTON, HYDE AND GLOSSOP HOSPITAL MANAGE-MENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER (resident) required for Casualty Department, Ashton-under-Lyne General Hospital. Appointment limited to 4 years. Minimum commencing salary £852 10s. p.a. but higher salary may be paid according to experience and qualifications.

Apply, giving age, experience, qualifications and 2 references, to Group Secretary, General Hospital, Ashton-under-Lyne.

ASHTON, HYDE AND GLOSSOP HOSPITAL MAN-AGEMENT COMMITTEE. HOUSE SURGEON required at Ashton-under-Lyne General Hospital. Preference will be given to pre-registration applicants. Recognised for F.R.C.S. (Eng.). Vacant end of April.

Applications, with copies of 2 testimonials, to Group Secretary, General Hospital, Ashton-under-Lyne, Lancs.

ALTON, HAMPSHIRE. LORD MAYOR TRELOAR ORTHOPÆDIC HOSPITAL. JUNIOR HOSPITAL MEDICAL OFFICER needed. Male or Female, non-resident.

Write, with full details of experience, to Group Secretary.

ALTRINCHAM GENERAL HOSPITAL, ANNEXE AND E.N.T. DEPARTMENT. (183 Beds.) SENIOR HOUSE OFFICER (surgical). This appointment affords excellent experience to suitably qualified candidates. Post recognised under F.R.C.S. regulations. Vacant mid-end April.

Applications, with names of 2 referees, to Group Secretary, North and Mid-Cheshire Hospital Management Committee, Sinderland-road, Altrincham.

BEDFORD GENERAL HOSPITAL. (439 Beds.) 2 resident Pre-registration HOUSE PHYSICIANS required approximately mid-May.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BEDFORD GENERAL HOSPITAL. (439 Beds.) Resident HOUSE SURGEON (gynæcology and obstetrics) required mid-May. Pre-registration post and recognised for D.Obst. R.C.O.G. The Unit comprises 26 gynæcological and 60 obstetric beds and a busy Outpatient Department.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, by 26th April, 1957.

BEDFORD GENERAL HOSPITAL. (439 Beds.) House SURGEON required. Pre- or post-registration. Recognised for F.R.C.S. Post offers exceptional opportunities for general experience in busy acute Surgical Units.

Inquiries and applications, with copies of 2 recent testimonials, to Group Secretary, 3, Kimbolton-road, Bedford.

BEDFORD GENERAL HOSPITAL. (439 Beds.) Ortho-PÆDIC HOUSE SURGEON required mid-May. Pre- or post-registration; recognised for F.R.C.S. Post offers wide experience in a busy Specialist Orthopædic and Traumatic Unit.

Inquiries and applications, with copies of 2 recent testimonials, to Group Secretary, 3, Kimbolton-road, Bedford.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 acute beds.) ORTHOPÆDIC HOUSE SURGEON (first, second, or third post) vacant now. Offers good opportunity for general experience in busy acute general hospital. Approved pre-registration post. Fully qualified practitioners may apply. Recognised for F.R.C.S.

Apply Group Secretary.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 Beds.) Locum ORTHOPÆDIC HOUSE SURGEON (Senior House Officer or House Officer grading according to experience).

Applications to Group Secretary.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. ASSISTANT PATHOLOGIST (Senior House Officer grade) required in Area Laboratory. Offers experience all branches of pathology. Salary £745.

Detailed applications to Group Secretary.

BEXLEY HOSPITAL, Dartford Heath, Bexley, Kent. BEXLEY HOSPITAL MANAGEMENT COMMITTEE. Applications invited for appointment of SENIOR HOUSE OFFICER at above Hospital. Salary £819 10s. p.a., with deductions of £150 p.a. for board, lodging, &c., if resident. The Hospital (2300 Beds) deals with all types of psychiatric illness and experience in all modern physical, occupational and psychotherapeutic procedure is available. Opportunities will be available to assist at outpatients clinics.

Applications, with names and addresses of 3 referees, should be sent to the Physician-Superintendent, Dr. L. C. COOK, M.D., D.P.M., within 14 days of the appearance of this advertisement.

BURTON GENERAL HOSPITAL AND ANDRESSEY HOSPITAL, BURTON UPON TRENT. HOUSE SURGEON (gynæcological and obstetrics) required at above Hospital as from 1st July, 1957. Post recognised for pre-registration purposes.

Apply Group Secretary.

BURTON-ON-TRENT GENERAL HOSPITAL. Junior HOSPITAL MEDICAL OFFICER ANÆSTHETIST required at the above Hospital as from 1st June, 1957. The post is normally resident but applicants for a non-resident post will be considered.

Applications to Group Secretary, General Hospital, Burton-on-Trent, as soon as possible.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. FAIRFIELD GENERAL HOSPITAL. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (psychiatry). The appointment is for 1 year in the first instance, subject to renewal annually. This post is recognised for the D.P.M. for 12 months.

Applications, with full details of age, qualifications, and experience, together with names of 2 referees, should be submitted to H. WILKINSON, Group Secretary.

Bury General Hospital, Bury, Lancs.

BROXBURN, WEST LOTHIAN. BANGOUR GENERAL HOSPITAL. (15 miles from Edinburgh.) Applications are invited for the post of HOUSE OFFICER in the General Surgical Unit of Bangour General Hospital. Salary and conditions of service in accordance with regulations.

Applications to Group Secretary and Treasurer, Board of Management, Bangour Hospital, Broxburn, West Lothian.

BIRMINGHAM ACCIDENT HOSPITAL, Bath-row, BIRMINGHAM, 15. (215 Beds and 8 House Surgeons.) HOUSE SURGEON (resident), vacant June. Hospital largest Traumatic Unit in country and treats over 50,000 new patients each year. Recognised for purpose of Casualty by R.C.S.(Eng.). Teaching programme by Consultant staff. 6 months appointment, some of which may be spent in 42-Bedded Medical Research Council's Burns Unit.

Apply, naming 2 referees, to Administrator by 1st May, 1957.

BIRMINGHAM, 9. LITTLE BROMWICH GENERAL HOSPITAL. PÆDIATRIC HOUSE PHYSICIAN (Male/Female), vacant now. Recognised for D.C.H. includes duties on infectious diseases ward, Neonatal Department, and clinics.

Apply Physician-Superintendent.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **Burton-on-Trent Group, General Hospital, Burton-on-Trent**

SURGICAL REGISTRAR (whole-time) required immediately for duties at Burton-on-Trent General Hospital. Experience in surgery essential. F.R.C.S. desirable. Hospital recognised for F.R.C.S. Resident.

(2) **Coventry Group No. 20, Stoney Stanton-road, Coventry**

REGISTRAR (orthopædic and general surgery) for Manor Hospital, Nuneaton (125 Beds). Recognised F.R.C.S. Experience specialty essential. Resident. Furnished flat available.

(3) **Wolverhampton Group, Royal Hospital, Wolverhampton**

SURGICAL REGISTRAR (resident). Duties in Royal Hospital and New Cross Hospital.

(4) **South Worcester Group, Castle-street, Worcester**

REGISTRAR for St. Wulstan's Hospital, Malvern (230 Beds), whole-time, resident. Good training general medicine required. Hospital mainly for pulmonary tuberculosis with 30 Beds for thoracic surgery.

(5) **Stafford Group, 13, Foregate-street, Stafford**

REGISTRAR (surgery), resident. Duties mainly at Staffordshire General Infirmary (175 Beds) and Yarnfield Recovery Unit (32 Beds). Recognised for F.R.C.S. Experience surgery essential, higher qualification desirable. House available for family if required.

Applications from Group Secretaries to be returned by 29th April, 1957.

BIRMINGHAM REGIONAL HOSPITAL BOARD. SENIOR REGISTRARS in Psychiatry.

(*a*) Shelton Hospital, Shrewsbury (972 Beds). Wide experience specialty and higher qualification required. Resident: single or married accommodation available.

(*b*) St. Matthew's Hospital, Burntwood (1234 Beds). Resident. Experience specialty and D.P.M. required.

(*c*) Hollymoor Hospital and Psychiatric Outpatient Clinic, Selly Oak Hospital, Birmingham. Hospital linked with Birmingham University for research in psychiatry and biochemistry. D.P.M. and considerable experience in psychiatry essential.

(*d*) 2 appointments at All Saints' Hospital (1385 Beds) and Ufficulme Early Treatment Centre, Birmingham. May be required to reside in Hospital when on duty. Experience specialty and D.P.M. required.

Successful candidates may subsequently be required to spend not more than 2 years in a selected hospital of the United Birmingham Hospitals under the interchange scheme agreed between the 2 Boards.

Application forms from Secretary, 10, Augustus-road, Birmingham, 15, to be returned by 6th May, 1957.

BIRMINGHAM, 15. ROYAL ORTHOPÆDIC HOSPITAL. SENIOR HOUSE OFFICER. Preferably with orthopædic experience. Recognised by Royal College of Surgeons. 336 Beds for long- and short-term orthopædic cases (non-traumatic) and extensive outpatient services.

Applications, with testimonials or names of referees, to Administrator.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Applications are invited for the post of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade). Post vacant 12th June, 1957. The post is suitable for persons training for pædiatrics or contemplating a career in pathology. The holder is expected to attend clinical rounds and meetings and to assist in the investigation of clinical problems.

Forms of application obtainable from the House Governor and should be returned to him immediately.

G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Applications are invited for the appointment of RESIDENT MEDICAL OFFICER in the grade of Senior House Officer, vacant 7th July, 1957, for 1 year.

Forms of application may be obtained from the House Governor and should be returned to him not later than 30th April, 1957.

G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Applications are invited for the post of RESIDENT SURGICAL OFFICER (Registrar), vacant 1st August, 1957, for 1 year. Preference will be given to applicants with a knowledge of pædiatric surgery and who hold a higher qualification.

Forms of application may be obtained from the House Governor and should be returned by 30th April, 1957.

G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM. UNITED BIRMINGHAM HOSPITALS. BIRMINGHAM AND MIDLAND HOSPITAL FOR WOMEN, Showell Green-lane, SPARKHILL, BIRMINGHAM, 11. Applications are invited from registered medical practitioners for the post of RESIDENT GYNÆCOLOGICAL HOUSE SURGEON for duty with the Professorial Unit from 1st June, 1957. The appointment is recognised for the M.R.C.O.G. and D.Obst.R.C.O.G.

Application forms, obtainable from the House Governor at the above address, to be returned not later than 30th April, 1957.

G. A. PHALP, Secretary.

BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of a HOUSE PHYSICIAN (pre-registration intern) for the Poole General and Alderney Hospitals. Post vacant on 17th May. And for a HOUSE PHYSICIAN (pre-registration intern) for the Poole General Hospital for a post which becomes vacant on 7th June.

Applications to the Hospital Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of GENERAL HOUSE SURGEON. The appointment, which becomes vacant on 14th May, 1957, is recognised for the F.R.C.S. examination and for pre-registration purposes.

Applications to the Hospital Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER (anæsthetics). The post, which becomes vacant on 25th May, 1957, is recognised for the D.A. and F.F.A.R.C.S., and is normally tenable for 12 months. Experience with Thoracic Unit available.

Applications to the Hospital Secretary.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (312 Beds.) 1 HOUSE SURGEON required mid-April. Recognised for pre-registration and F.R.C.S.

Applications, stating usual particulars, and naming 2 referees, to the Administrative Officer.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (312 Beds.) RESIDENT ANÆSTHETIST (Senior House Officer grade) required for 1 year, with interchange of duties by agreement, at the Brighton General Hospital and other specialised units within the Brighton and Lewes Group. Post recognised for F.F.A.R.C.S. and D.A. Applications will be considered for permanent post or as locum.

Applications, stating age, nationality and experience, and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital.

BRISTOL MENTAL HOSPITAL MANAGEMENT COMMITTEE. BARROW AND FISHPONDS HOSPITALS. Applications invited from registered medical practitioners for appointment as SENIOR HOUSE OFFICER. Experience in general medicine or neurology an advantage. The Group includes Modern Admission Units, Neurosis Centre, and Day Hospital, with Departments of Applied Psychology and Electro-encephalography. The appointment offers opportunities for experience in many aspects of acute and chronic psychiatric illness.

Applications giving details of experience, and names of 3 referees, should be sent to Medical Superintendent, Barrow Hospital, Barrow Gurney, near Bristol.

BRISTOL MENTAL HOSPITAL MANAGEMENT COMMITTEE. Applications invited from registered medical practitioners for JUNIOR HOSPITAL MEDICAL OFFICER post at Fishponds Hospital. National scale and conditions. Post offers wide scope in psychiatry and its special branches including Neurosis Centre and Day Hospital. Holder will have opportunity of studying and gaining experience for Diploma in Psychological Medicine. Board-residence can be provided for single officer.

Applications, with names of 3 referees, should be sent to Medical Superintendent, Barrow Hospital, Barrow Gurney, near Bristol.

CARLISLE. GARLANDS HOSPITAL. (1060 Beds.) GARLANDS HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER at the above Mental Hospital. Resident post. Resident accommodation is available for which a deduction will be made. Salary scale £852 10s.–£55–£1182 10s. p.a. Appointment subject to the National Health Service superannuation regulations and to the conditions and terms of service laid down by the Minister of Health.

Applications, stating age, qualifications and experience and the name of 2 referees, should be sent to the Medical Superintendent as soon as possible.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. Senior REGISTRAR in Radiology (Diagnostic Department).

Apply, with full particulars with names of 3 referees, to Secretary by 4th May.

CAMBRIDGE (near). FULBOURN HOSPITAL. Senior HOUSE OFFICER (resident or non-resident). Previous psychiatric experience not required. This Hospital of 976 Beds is linked with the Cambridge University Department of Psychology and Addenbrooke's Hospital, and provides a basic psychiatric training leading to the D.P.M.

Applications, stating age, qualifications and experience, with names of 2 referees, should be sent to—

Dr. D. H. CLARK, Medical Superintendent.

Fulbourn Hospital, near Cambridge.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botley's Park War Hospital). (430 Beds.) RESIDENT HOUSE SURGEON (Intern) required from 16th May, 1957. Salary in accordance with terms and conditions of National Health Service.

Applications, together with names and addresses of referees, to be sent to the Physician-Superintendent, St. Peter's Hospital, as soon as possible.

CHESTERFIELD. SCARSDALE HOSPITAL. Senior HOUSE OFFICER for Obstetrics and Gynæcology required 5th May at above Hospital, which includes 72-Bed Maternity Unit. Post recognised for M.R.C.O.G. and D.Obst.R.C.O.G. purposes. Salary now £819 10s. p.a.; national conditions.

Please apply M. H. BOONE, Group Secretary, Chesterfield Hospital Management Committee at Chesterfield Royal Hospital.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. (202 acute beds.) RESIDENT HOUSE SURGEON required for 6 months appointment. National salary scale for first, second, or third posts. Post approved for pre-registration practitioners. Also recognised for F.R.C.S. 7 residents including Resident Surgical Officer and 3 House Surgeons. Vacant immediately.

Apply to Senior Administrative Officer.

CHICHESTER. ST. RICHARD'S HOSPITAL. (400 Beds.) CHICHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, 2 HOUSE SURGEONS for General Surgery (pre-registration) for 6 months only in the first instance. Posts vacant now. Posts recognised for F.R.C.S.

Applications, stating age, qualifications and experience, giving names of 2 persons from whom reference may be obtained, should be sent to the Surgeon-Superintendent.

CLACTON AND DISTRICT HOSPITAL, Clacton-on-SEA, ESSEX. (58 Beds.) REGISTRAR (temporary) required as Resident Casualty Officer during summer, for period not exceeding 6 months.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

COLCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for :—

Black Notley Hospital, Braintree, Essex (516 Beds)

Post of SENIOR HOUSE OFFICER for Non-pulmonary Tuberculosis Unit of approximately 120 Beds, particularly for skeletal and renal tuberculosis. Recognised for F.R.C.S.

Essex County Hospital, Colchester, Essex (185 Beds)

Post of SENIOR HOUSE OFFICER (anæsthetics). Post tenable for 1 year. Recognised for F.F.A.R.C.S. and D.A. The successful candidate will be called upon to give anæsthetics in other hospitals in the Group.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

CREWE AND DISTRICT MEMORIAL HOSPITAL. (108 Beds Acute, and Continuation 32 Beds.) SENIOR HOUSE OFFICER (Orthopædic and Casualty Department). Modern department about to open. Main duties in Casualty Section. Whitley Council salary and conditions of service.

Applications, stating age, qualifications, &c., with names of 2 referees, to be sent as soon as possible to the Group Secretary, South Cheshire Hospital Management Committee, Barony Hospital, Nantwich, Cheshire.

CROYDON. GENERAL HOSPITAL. (200 Beds.) Croydon GROUP HOSPITAL MANAGEMENT COMMITTEE. Locum Tenens SURGICAL REGISTRAR (resident or non-resident). 1st–16th June, 1957, both dates inclusive.

Applications in writing to—

GEORGE A. PAINES, Group Secretary,
Hospital Management Committee.

General Hospital, London-road, Croydon.

CROYDON. MAYDAY HOSPITAL. (611 Beds.) Croydon GROUP HOSPITAL MANAGEMENT COMMITTEE. SURGICAL REGISTRAR, vacant 3rd June. Post recognised for F.R.C.S. examination.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, London-road, Croydon, to be returned within 14 days from the publication of this advertisement.

CROYDON. ST. MARY'S MATERNITY HOSPITAL. (33 Beds.) OBSTETRIC HOUSE OFFICER (resident). Applications invited from pre-registration and registered medical practitioners. Post is recognised for D.Obst.R.C.O.G. Preference will be given to those who have held a House Surgeon post. Appointment commences on 13th May.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, London-road, Croydon.

DARTFORD. THE SOUTHERN HOSPITAL. Dartford HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON (ophthalmology) required at above Hospital for a new unit about to be opened. The post is recognised for pre-registration purposes.

Applications, stating age, training, qualifications, experience and the names of 2 referees, to be sent to the Medical Superintendent.

DARTFORD. THE SOUTHERN HOSPITAL. Dartford HOSPITAL MANAGEMENT COMMITTEE. Locum HOUSE SURGEON (ophthalmology) required immediately at above Hospital.

Inquiries and applications to the Medical Superintendent.

DRIFFIELD, YORKSHIRE. EAST RIDING GENERAL HOSPITAL. (247 Beds.) HOUSE SURGEON (first, second, or third post), required now. Casualty, general surgery, orthopædics, and some gynæcology. Approved pre-registration post. Fully qualified practitioners may apply.

Apply Group Secretary, Westwood Hospital, Beverley, Yorkshire.

DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP, BIRMINGHAM REGION.

The Guest Hospital, Dudley (154 Beds)

SENIOR HOUSE OFFICER (anæsthetics).
SENIOR HOUSE OFFICER (casualty). Post now vacant.
SENIOR HOUSE OFFICER (surgical). Post now vacant.
HOUSE OFFICER (surgical), pre-registration. Post now vacant.

Wordsley Hospital, near Stourbridge (478 Beds)

SENIOR HOUSE OFFICER (surgical).

Apply, Group Secretary, Guest Hospital, Dudley.

DONCASTER ROYAL INFIRMARY. Applications are invited for the post of SENIOR HOUSE OFFICER in the Orthopædic Department. The post is recognised under the Fellowship regulations.

Applications to the Group Secretary, Doncaster Hospital Management Committee, at Doncaster Royal Infirmary.

DORKING GENERAL HOSPITAL, Horsham-road, DORKING, SURREY. (252 Beds.) Applications are invited from candidates possessing previous experience for the post of SENIOR HOUSE PHYSICIAN to Department of Medicine. The medical firm consists of Visiting Consultant Physician, a full-time Physician, and a Resident House Physician (advertised post). Vacant 8th July, 1957. The post offers wide experience in general medicine and gives an excellent opportunity for candidates studying for M.R.C.P. Salary £819 10s. p.a., less £150 p.a. for residential emoluments.

Apply to the Medical Superintendent by 2nd May, 1957.

DOUGLAS. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) Applications are invited for the pre-registration post of HOUSE SURGEON at this busy general hospital. Establishment for 4 House Officers. Salary in accordance with National Whitley scales. Manx income-tax—3s. in the £. Post now vacant.

Apply to the Secretary, Noble's Isle of Man Hospital, Douglas, enclosing copies of recent testimonials.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR, North Cambridgeshire and Clarkson Hospitals, Wisbech (271 Beds). Post provides experience in general medicine, pædiatrics and geriatrics, also facilities for study. Married quarters in flat near Hospital. Appointment for 1 year, renewable for second year.

Applications, stating age, experience and the names of 3 referees, to the Board's Senior Administrative Medical Officer, 117, Chesterton-road, Cambridge, by 29th April, 1957. Candidates invited to visit Hospital by direct arrangement with Hospital Management Committee Secretary, North Cambridgeshire Hospital, Wisbech.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (702 Beds.) RESIDENT HOUSE SURGEON (general and genito-urinary) for above Hospital. Post vacant 15th May, 1957. Recognised for F.R.C.S. and pre-registration purposes.

Applications, stating age, qualifications and experience, and enclosing copies of 3 recent testimonials, to Medical Director of Hospital by 27th April, 1957.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. Appointment of RESIDENT HOUSE SURGEON (third post), vacant 30th June, 1957. Post provides experience and duties in both general surgery and orthopædics. 6 months appointment. Post recognised for F.R.C.S. by the Royal College of Surgeons.

Applications, with the names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, at Chase Farm Hospital.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. RESIDENT HOUSE PHYSICIAN required 6th June. Pre-registration post.

Applications, stating age, qualifications, and experience, with copies of 2 recent testimonials, should be sent as soon as possible to Group Secretary at above address.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. RESIDENT HOUSE SURGEON required 11th June. Pre-registration post recognised for F.R.C.S.

Applications, stating age, qualifications, and experience, with copies of 2 recent testimonials, should be sent as soon as possible to Group Secretary at above address.

GLASGOW NORTHERN HOSPITALS BOARD OF MANAGEMENT. Applications are invited for the following posts at Western District Hospital, Glasgow.

(*a*) SENIOR HOUSE OFFICER in Surgical Unit.
(*b*) SENIOR HOUSE OFFICER in Obstetrics and Gynæcology Unit.

The appointments will be for 1 year in the first instance.

Applications, stating age, qualifications, experience and present appointment and naming 2 referees, to be lodged with the Secretary, 13, Woodside-place, Glasgow, C.3, by 23rd April, 1957.

GLASGOW. ROYAL HOSPITAL FOR SICK CHILDREN, YORKHILL, GLASGOW. Applications are invited for the post of SENIOR HOUSE OFFICER (resident) in Surgical Pædiatrics at the above Hospital. National Health Service salary and conditions of service.

Applications, with names of 3 referees, to be lodged with the Secretary, Board of Management for Glasgow and District Children's Hospitals, 86, St. Vincent-street, Glasgow, C.2.

GRAVESEND AND NORTH KENT HOSPITAL, Graves-END. MEDWAY AND GRAVESEND HOSPITAL MANAGEMENT COMMITTEE. Locum HOUSE SURGEON required immediately until permanent appointment is made.

Applications to Hospital Secretary as soon as possible.

GUILDFORD. ST. LUKE'S HOSPITAL. (389 Beds.) GUILDFORD GROUP HOSPITAL MANAGEMENT COMMITTEE. The post of HOUSE SURGEON (pre-registration) which is recognised for the F.R.C.S., is now vacant.

Applications, with copies of recent testimonials, should be sent to the Physician-Superintendent.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (233 Beds.) RESIDENT HOUSE PHYSICIAN required from 20th May. Post is tenable for 6 months and recognised for pre-registration candidates.

Applications, with copies of 3 testimonials, should be sent to the Hospital Secretary as soon as possible.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (233 Beds.) HOUSE SURGEON for Orthopædic and Traumatic Unit. The post is tenable for 6 months and is recognised for the F.R.C.S. examination and open to pre-registration candidates. The unit deals with many traumatic cases.

Applications, with copies of 3 testimonials, should be sent to the Hospital Secretary as soon as possible.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (233 Beds.) RESIDENT HOUSE SURGEON required for general surgery. Post is vacant on 20th May and tenable for 6 months. It is approved for pre-registration candidates and recognised for the F.R.C.S. examination.

Applications, with copies of 3 testimonials, should be sent to the Hospital Secretary as soon as possible.

HAROLD WOOD HOSPITAL, Harold Wood, Essex (near London). (415 Beds.) SENIOR HOUSE OFFICER (anæsthetics), resident. Main general and casualty hospital in Group. Recognised for D.A. and F.F.A.R.C.S.

Apply, giving full details, to the Hospital Secretary (Tel.: Ingrebourne 2881).

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) HOUSE PHYSICIAN required. Pre-registration post vacant 16th May, 1957. National scale of salary.

Apply to Hospital Administrator.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) HOUSE SURGEON required. Pre-registration post vacant 5th May, 1957. National scale of salary.

Apply to Hospital Administrator.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. Locum Tenens CASUALTY OFFICER (Junior Hospital Medical Officer) required for period 15th May–4th June, inclusive.

Applications, with copies of 2 recent testimonials, should be sent to the Hospital Secretary.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. HOUSE SURGEON (pre-registration) required.

Applications, giving full details and copies of recent testimonials, should be sent to the Hospital Secretary at once.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited for appointment of RESIDENT HOUSE PHYSICIAN (Male or Female), second post held. Recognised pre-registration post. 6 months appointment. Preference given to applicants who have held resident surgical or medical posts in general hospital. Duties to commence 1st June, 1957.

Applications to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HOVE GENERAL HOSPITAL, Sackville-road, Hove, SUSSEX. (75 Beds.) SENIOR HOUSE OFFICER (recognised for F.R.C.S.) vacant 11th May. Duties of Resident Surgical Officer. Appointment for 1 year.

Applications together with 2 names and addresses for reference to the Administrative Officer.

HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in the E.N.T. Department of the Victoria Hospital for Sick Children and the Hull Royal Infirmary. The post, which is vacant on 7th May, is recognised for the F.R.C.S. and D.L.O.

Applications, with testimonials, should be sent to the Hospital Secretary, Victoria Hospital for Sick Children, Park-street, Hull.

ILFORD. KING GEORGE HOSPITAL, Eastern-avenue, ILFORD. There will be the following vacancies for HOUSE SURGEONS at above Hospital.

First or second post pre-registration, 18th May.

Second post pre-registration, 8th June.

Both posts will be tenable for 6 months.

Applications, giving full particulars and accompanied by testimonials, should be sent to the undersigned within 7 days of the appearance of this advertisement.

H. F. HARRIS, Group Secretary,
Ilford and Barking Group Hospital Management Committee.

ILKLEY. MIDDLETON HOSPITAL. (430 Beds.) Resident SENIOR HOUSE OFFICER (surgical) required for Major Thoracic Surgical Unit at the above Hospital.

Applications, stating age, nationality, qualifications, and experience, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE SURGEON to the Fracture and Orthopædic Department, vacant on 23rd June, 1957. Approved pre-registration post.

Applications, with copies of recent testimonials, to the Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE SURGEON to the E.N.T. and Ophthalmic Departments, vacant on 1st June, 1957. The post is recognised for pre-registration and for the D.L.O. examination.

Applications, giving full particulars and copies of recent testimonials, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL, Anglesea ROAD WING. Applications are invited for the post of HOUSE PHYSICIAN, vacant on 1st June, 1957. Approved pre-registration post.

Applications, stating age, nationality, and experience, together with copies of 3 recent testimonials, to reach the Hospital Secretary by 14th May, 1957.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE SURGEON to the Senior Consultant General Surgeon, vacant on 21st April, 1957. The post is recognised for pre-registration and for the F.R.C.S. examinations.

Applications, with copies of recent testimonials, to Hospital Secretary.

LEAMINGTON SPA. WARNEFORD GENERAL HOSPITAL. (197 Beds.) HOUSE PHYSICIAN. Vacancy suitable for fully qualified or pre-registration applicant. Post vacant 9th May, 1957.

Applications, with copies of 2 recent testimonials, to be sent to Hospital Secretary.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SURGICAL REGISTRAR required (whole-time), non-resident. Candidates may visit Hospital by direct appointment.

Application forms obtainable from, and returnable to, the Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 30th April.

LEEDS REGIONAL HOSPITAL BOARD. Registrar vacancies.

General Medicine

(i) Wakefield A Group (70 general medical beds) with additional duties in the Wakefield B Group.

(ii) York A and Tadcaster Group (130 general medical beds). Non-resident.

General Surgery

Hull Royal Infirmary (80 general surgical beds) and other hospitals in the Hull A Group including additional duties in the Casualty Department. Non-resident.

General/Orthopædic Surgery

(i) York A and Tadcaster Group. Resident or non-resident. Duties mainly at York County and City Hospitals. Aggregate of 110 general surgical and 70 orthopædic surgery beds. Duties divided between general and orthopædic surgery. May include some duties in the Casualty Department.

(ii) Halifax Group. 1 of 3 similar posts. Duties divided between general and orthopædic surgery (180 general surgical and 81 orthopædic surgery beds). May include some duties in the Casualty Department. Preferably resident.

Infectious Diseases

Leeds Road Hospital, Bradford (160 infectious diseases beds). Resident.

Orthopædic Surgery

(i) Woodlands Orthopædic Hospital, Rawdon (100 Beds) and Orthopædic Outpatient Department, Bradford Royal Infirmary. Offers excellent training in all branches of Accident and Orthopædic Surgery. Resident.

(ii) St. James's Hospital, Leeds (64 orthopædic beds) and the Public Dispensary, Leeds. Non-resident.

(iii) Harrogate General Hospital (38 orthopædic beds). May include some duties in the Casualty Department. Non-resident.

Pædiatrics

Victoria Hospital for Sick Children, Hull, and other general hospitals with pædiatric beds in the Hull A and East Riding Hospital Management Committee Groups. (Aggregate 150 Beds.) Non-resident.

Radiotherapy

Regional Radium Institute, Bradford (50 Beds). Preferably resident. Unit provides a complete Radiotherapy Service for approximately 1,000,000 population.

Applications, stating age, qualifications and details of present and previous appointments, with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 25th April, 1957.

LEEDS REGIONAL HOSPITAL BOARD. Senior REGISTRAR vacancies.

Anæsthetics

Duties initially at Thoracic Surgical Units of the General Infirmary at Leeds and at Pinderfields General Hospital, Wakefield. The person appointed will be expected, if required, to interchange duties with the Senior Registrar in the Department of Anæsthetics at the General Infirmary.

Psychiatry

St. James's Hospital, Leeds (General Hospital Psychiatric Unit). Candidates must hold the D.P.M. or equivalent qualification. The appointment offers excellent opportunity for experience in dealing with neurosis. The work will be in association with the University Department of Psychiatry, research and teaching may be undertaken.

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 2 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 9th May, 1957.

LEEDS. UNITED LEEDS HOSPITALS/LEEDS REGIONAL HOSPITAL BOARD. REGISTRAR in Thoracic Surgery. First year normally at the Regional Thoracic Centre, Pinderfields General Hospital, Wakefield (56 Beds), which is under the charge of the Consultants to the Teaching Hospital. Second year if possible at the General Infirmary at Leeds. Recognised for F.R.C.S.

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names, and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 25th April, 1957.

LINCOLN. LAWN HOSPITAL, Union-road, Lincoln. (Mental Hospital for Private Patients—100 Beds.) **LINCOLN NO. 2 HOSPITAL MANAGEMENT COMMITTEE.** JUNIOR HOSPITAL MEDICAL OFFICER (full-time), required. All modern treatments used at this active Hospital. Pleasant flat available.

Apply to the Medical Superintendent with copies of 3 testimonials.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for a post of REGISTRAR in Medicine for the period from 18th June, 1957, to 30th September, 1958. Annual reappointment thereafter until completion of the normal period of training will be considered without need for further application.

Apply by 4th May, 1957, on form obtainable from the Secretary, 80, Rodney-street, Liverpool, 1.

LOUTH COUNTY INFIRMARY. (215 Beds.) Sheffield REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT REGISTRAR (orthopædics and casualty) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 29th April, 1957, giving age, nationality, qualification, present and previous appointments with dates, naming 3 referees.

MAIDENHEAD HOSPITAL, Berkshire. Applications invited for post of HOUSE PHYSICIAN, vacant 4th May. Preference given to persons seeking a pre-registration post.

Applications, stating age, nationality and qualifications, with names of 3 referees, to Secretary.

MAIDSTONE. PRESTON HALL HOSPITAL, British LEGION VILLAGE, MAIDSTONE, KENT. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER at the above Hospital which contains 330 Beds for the treatment of tuberculosis and other chest diseases and includes a major Thoracic Surgical Unit. Candidates should have good experience in general medicine and in the treatment of pulmonary tuberculosis in adults. Appointment for 1 year in the first instance subject to renewal annually. Salary scale £852 10s.–£55–£1182 10s.

Applications, stating age, qualifications, and experience, with relevant dates, together with names and addresses of 2 referees, to be sent to the Secretary to the Preston Hall Hospital Management Committee by 30th April, 1957.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE SURGEON. 6 months appointment. Post vacant now. Salary at the rate of £467 10s.–£577 10s. p.a. A deduction at the rate of £125 a year is made for board and lodging, and other services provided.

Applications should be forwarded, as soon as possible, to the Administrative Officer at the Hospital.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR in Chest Diseases, the main duties to be with the Bury and Rossendale Hospital Management Committee, with duties at Chest Clinics and at Aitken Sanatorium and Peel Hall Pulmonary Hospital, and other hospitals in the area.

Apply, stating names of 2 referees, to—

H. WILKINSON, Group Secretary.

Bury General Hospital, Bury, Lancs.

MANCHESTER REGIONAL HOSPITAL BOARD. Senior REGISTRAR in Radiotherapy at the Christie Hospital and Holt Radium Institute, Manchester. D.M.R.T. essential and F.F.R. desirable.

Application forms, obtainable from the Senior Administrative Medical Officer, Cheetwood-road, Manchester, 8, should be returned by 6th May, 1957.

MANCHESTER REGIONAL HOSPITAL BOARD. Roch-DALE INFIRMARY. (109 surgical beds.) RESIDENT SURGICAL OFFICER (Registrar grade) required for this busy surgical hospital which has a large Outpatient Department. Recognised for F.R.C.S.

Apply at once, with details of experience and qualifications and names of 3 referees, to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited for the appointment of REGISTRAR in Obstetrics and Gynæcology, vacant immediately. Salary at national scale. Initially the appointment will be for 1 year, renewable normally for a second year. The successful candidate will act during the first year as Resident Surgical Officer in the gynæcological branch at Whitworth Park, and possibly during the second year as Resident Obstetric Surgeon in the obstetrical branch of the Hospital at Whitworth-street. The duties include some teaching, the supervision of the work of House Officers and Resident Medical Students, and very considerable clinical responsibility. Candidates must, therefore, have had fairly full previous experience in obstetrics and gynæcology. A higher qualification is not essential.

Forms of application may be obtained from the undersigned. The closing date is 30th April, 1957.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General Hospital—433 Beds.) HOUSE PHYSICIAN (pædiatrics) required for mid-May. Post-registration. There is a Midwifery Unit of 73 Beds and a Pædiatric Unit which includes 10 thoracic surgical beds. Recognised for D.C.H.

Application forms from Secretary.

MARGATE. ROYAL SEA BATHING HOSPITAL. (Surgical Tuberculosis and Orthopædics—244 Beds.) The post of SENIOR HOUSE OFFICER (1 of 2) is largely an orthopædic one, and affords experience in the treatment of tuberculous and non-tuberculous orthopædic conditions. There is also a Genito-urinary Unit of 35 Beds and a small number of beds for other tuberculous conditions. The post is recognised for the F.R.C.S. and is suitable for someone reading for a higher surg cal examination. Salary £819 10s. p.a., less £150 for residential emoluments.

Applications, with copies of testimonials, to Hospital Secretary.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the 2 whole-time appointments of REGISTRAR in the Department of Anæsthetics at the Royal Victoria Infirmary which is associated with the Medical School of the University of Durham. 1 post will become vacant late in July and the second some weeks later. The posts, which are non-resident except for rotational emergency duty, will be for 1 year in the first instance and are subject to the terms and conditions of service of hospital medical staff in the National Health Service. They offer opportunity for study for the F.F.A.R.C.S. examination. Applicants should have held postgraduate appointments in medicine and surgery and should have had some experience in anæsthetics.

Applications, giving full details and the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.

Royal Victoria Infirmary, Newcastle upon Tyne.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the whole-time appointment of SENIOR HOUSE OFFICER in the Department of Anæsthetics at the Royal Victoria Infirmary. The post is for 1 year and will be subject to the terms and conditions of service of hospital medical staff. It will be non-resident except for rotational emergency duty and offers the opportunity for study for the F.F.A.R.C.S. Applicants should have held postgraduate appointments in medicine and surgery but previous experience in anæsthetics is not essential.

Applications, giving full details and the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.

Royal Victoria Infirmary, Newcastle upon Tyne.

NEWCASTLE GENERAL HOSPITAL. (838 Beds.) NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required for Orthopædic Department, vacant 1st June, 1957.

Applications, together with names and addresses of 2 referees, should be sent to the Secretary, Newcastle General Hospital, Newcastle upon Tyne, 4.

NEWCASTLE REGIONAL HOSPITAL BOARD.

REGISTRAR SURGEON (whole-time), Sedgefield Group of hospitals—main hospital, Sedgefield General (336 Beds). Modern furnished or unfurnished self-contained flat (5 rooms) available, also single accommodation. Post recognised for F.R.C.S. examination.

REGISTRAR RADIOTHERAPIST (whole-time). Regional Cancer Service—main hospital, Shotley Bridge General (533 Beds). Single accommodation available.

REGISTRAR ANÆSTHETIST (whole-time). Hartlepools Group of hospitals—main hospitals, General (471 Beds), Cameron (73 Beds), Hartlepools (134 Beds). Single accommodation available.

REGISTRAR ORTHOPÆDIC SURGEON (whole-time). Hexham Group of hospitals—main hospital, Hexham General (304 Beds—approximately 100 orthopædic beds). Hospital recognised for F.R.C.S. Furnished or unfurnished, married or single, accommodation available.

REGISTRAR ANÆSTHETIST (whole-time), South Shields Group of hospitals—main hospital, General Hospital (602 Beds), Ingham Infirmary (158 Beds). Post recognised for F.F.A.R.C.S. Married or single accommodation available.

SENIOR REGISTRAR PHYSICIAN, Geriatric Unit, Sunderland Group of hospitals—main hospital, Sunderland General (439 Beds—217 geriatric beds). Appointment for 1 year only. Post suitable for Senior Medical Registrar with a higher qualification requiring experience in geriatrics.

REGISTRAR PATHOLOGIST (whole-time), Newcastle upon Tyne Group of hospitals—main hospital, Newcastle General (838 Beds). A large new Institute of Pathology includes hospital laboratory, M.R.C. laboratory, and Regional Blood Transfusion Centre.

SENIOR REGISTRAR PLASTIC SURGEON (whole-time) for Regional Plastic Surgery Service—main hospital, Newcastle General (838 Beds). Appointee will undertake 2 sessions per week at the Royal Victoria Infirmary, Newcastle (Teaching Hospital) and may be required to undertake duties in hospitals throughout the region: to reside in Newcastle upon Tyne. Candidates must possess a higher surgical qualification and should preferably have had some previous experience in plastic surgery. Further particulars from Senior Plastic Surgeon, General Hospital, Westgate-road, Newcastle upon Tyne, 4.

REGISTRAR PHYSICIAN (whole-time), South Shields Group of hospitals—main hospital, South Shields General (602 Beds). Married or single accommodation available.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWTON ABBOT HOSPITAL. (General Section, 65 Beds.) Locum RESIDENT SENIOR HOUSE SURGEON required for 1 week from 18th to 25th May, 1957, inclusive.

Applications, stating nationality, qualifications, age, with copy testimonials, to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

NORTHAMPTON GENERAL HOSPITAL. (482 Beds.) Immediate vacancy for HOUSE OFFICER (general surgery). Recognised for F.R.C.S. and pre-registration. 6 months appointment in first instance.

Applications as soon as possible to—

S. G. HILL, Superintendent.

NOTTINGHAM. CITY HOSPITAL. (611 Beds.) Applications are invited for the post of HOUSE SURGEON, vacant 15th May, 1957. Recognised for pre-registration purposes.

Applications, stating age, nationality, qualifications, and experience, together with copies of not more than 3 testimonials, to be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM. CITY HOSPITAL. (811 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER at the Department of Thoracic Surgery. Post vacant immediately. Salary £745 p.a., less £150 for residential emoluments. The appointment will be for 1 year.

Applications, stating age, nationality, qualifications, and experience, together with copies of not more than 3 testimonials, to be submitted immediately to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

OXFORD REGIONAL HOSPITAL BOARD. Registrar (whole-time) in Anæsthetics to the Northampton Group of hospitals. Post provides good experience in all branches and is recognised for the F.F.A.R.C.S. Single accommodation available.

Applications on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, to reach him by 29th April.

OXFORD REGIONAL HOSPITAL BOARD. Registrar in Pathology to Stoke Mandeville Hospital. This is a central clinical laboratory serving Stoke Mandeville and the Aylesbury hospitals and acting as parent to High Wycombe and Amersham laboratories. It is closely connected with research projects being undertaken at Stoke Mandeville Hospital. Appointment for 1 year in the first instance, eligible for extension for a second year. Applicants may visit Stoke Mandeville by arrangement with the Pathologist.

Application forms from the Secretary, Registrars Committee, 43, Banbury-road, Oxford, should be returned to him by 30th April, 1957.

OXFORD REGIONAL HOSPITAL BOARD. Registrar (whole-time) in Obstetrics and Gynæcology to the hospitals of the Swindon area. Appointment will be for 1 year, eligible for extension to 2 years.

Forms, obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, must reach him by 30th April.

OXFORD UNIVERSITY. UNITED OXFORD HOSPITALS. SENIOR REGISTRAR in Ophthalmology at Oxford Eye Hospital. The appointment will be for 1 year in the first instance and eligible, subject to satisfactory service, for extension to 4 years. Preference will be given to candidates with a higher qualification in ophthalmology. If the successful candidate is interested in research, 3 sessions per week may be available in the Nuffield Laboratory of Ophthalmology. Details of the appointment from the Administrator, United Oxford Hospitals, Radcliffe Infirmary, Oxford.

Applications, on forms obtainable from the Secretary, Joint Committee for Senior Registrars, 43, Banbury-road, Oxford, must reach him by 27th April, 1957.

OXFORD. UNITED OXFORD HOSPITALS. Oxford REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR (whole-time) in Obstetrics and Gynæcology to the hospitals of the Northampton area. Applicants should hold the M.R.C.O.G. or equivalent. The scheme for providing experience in the United Oxford Hospitals for part of the appointment is available if mutually agreed.

Applications, on forms obtainable from the Secretary, Registrars Committee, 43, Banbury-road, Oxford, should reach him by 29th April, 1957.

ORPINGTON HOSPITAL, Orpington, Kent. Resident HOUSE PHYSICIAN required for Geriatric Department at mainly General Hospital. Position (vacant 1st June, 1957) offers good experience and is recognised as pre-registration medical post.

Apply, with copies of 2 recent testimonials, to the Physician-Superintendent.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL.

SENIOR HOUSE OFFICER in Medicine, vacant 12th June, 1957.

SENIOR HOUSE OFFICER in Casualty, vacant 1st July, 1957. Recognised for the F.R.C.S. Central Casualty Department of the South Devon and East Cornwall Hospital, Freedom Fields, Plymouth.

HOUSE PHYSICIANS (pre-registration posts), vacancies (2) 1st July, 1957. Freedom Fields Section.

HOUSE SURGEONS (pre-registration posts), vacancies 9th June, 1st and 5th July, 1957. Recognised for the F.R.C.S. Greenbank Road Section.

HOUSE SURGEON (pre-registration post), vacant 1st May, 1957. Recognised for the F.R.C.S. Devonport Section.

Applications, stating age, nationality, and experience, with names of 3 referees, to be sent to—

F. HALL, Deputy Group Secretary, Plymouth.
South Devon and East Cornwall General Hospital Group.
7, Nelson-gardens, Stoke, Plymouth.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE. (316 Beds and large Outpatient Department. Committee's base hospital serving population of 174,000. Recognised for D.Obst.R.C.O.G., F.R.C.S., D.C.H., F.F.A.R.C.S., D.A.) PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER (surgery) at the above Hospital. The person appointed will also be required to undertake duties at the Porth and District Hospital.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent as soon as possible to the Group Secretary, Courthouse-street, Pontypridd.

POOLE GENERAL HOSPITAL. Bournemouth and East DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE SURGEON (pre-registration intern). The post which becomes vacant on 10th June is recognised for the F.R.C.S. and F.R.C.S.E.

Applications to the Hospital Secretary.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

(1) **Royal Portsmouth Hospital** (70 surgical beds)

(*a*) SENIOR HOUSE SURGEON, vacant now.

(*b*) HOUSE SURGEON, vacant now. Pre-registration post.

(2) **Infectious Diseases Hospital**

SENIOR HOUSE OFFICER required with duties also on the tuberculosis wards and the Poliomyelitis, Diagnostic, and Respiratory Centre. Vacant 1st June.

Applications, stating age, experience, and qualifications, together with the names of 2 referees, should be forwarded as soon as possible to E. H. HURST.

St. Mary's Hospital, Milton-road, Portsmouth.

REDHILL COUNTY HOSPITAL, Earlswood Common, REDHILL, SURREY. HOUSE SURGEON. Appointment recognised for pre-registration training and for F.R.C.S. Fully-registered candidates may apply.

Applications to Group Secretary, Redhill Hospital Management Committee, Earlswood Mount, Pendleton-road, Redhill, Surrey (Redhill 3581, ext. 20).

REDHILL. EAST SURREY HOSPITAL, Shrewsbury-road, REDHILL, SURREY. SENIOR HOUSE OFFICER (Male), mainly surgical. Post vacant immediately.

Apply to the Hospital Secretary.

READING AREA DEPARTMENT OF MEDICINE. Applications are invited from registered and provisionally registered medical practitioners for 2 posts as RESIDENT HOUSE PHYSICIAN, vacant 1st June, 1957, for a period of 6 months. Successful candidates will be required to carry out duties at the following Reading Hospitals: Royal Berkshire Hospital (398 Beds), Battle (374 Beds), and Prospect Park (104 Beds).

Write immediately, stating age, qualifications with dates, nationality, present post, with copies of 2 recent testimonials, to Secretary, Royal Berkshire Hospital, Reading.

READING. BATTLE HOSPITAL. (391 Beds.) Applications are invited from registered medical practitioners for the post of RESIDENT JUNIOR HOUSE SURGEON in the Accident and Orthopædic Department. Post vacant 2nd June, 1957. F.R.C.S. recognised. Also casualty duties.

Apply, stating age, qualifications with dates, nationality, present post, with 1 copy of recent testimonial, to Hospital Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. (339 Beds.) READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male or Female) for the appointment of a SENIOR HOUSE OFFICER (anæsthetics), vacant 1st May, 1957, for a period of 1 year. Post recognised for F.F.A.R.C.S. Salary £745 p.a., less £150 for board-residence.

Write, stating age, qualifications with dates, nationality and present post, together with the names of 3 referees, to the Group Secretary, Reading and District Hospital Management Committee, 3, Craven-road, Reading.

RICHMOND. ST. JOHN OF GOD'S HOSPITAL, Scorton, RICHMOND, YORKSHIRE. Vacancy on 1st May, for Male JUNIOR HOUSE MEDICAL OFFICER. Whitley scale.

Apply—Rev. PRIOR.

RICHMOND, SURREY. ROYAL HOSPITAL. (Acute General Hospital—121 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER in Surgery. Post vacant now.

Applications immediately, with names of 2 referees, to the Administrative Officer.

ROCHDALE INFIRMARY. Senior House Officer (anæsthetics) required.

Applications, with names and addresses of 2 referees and full particulars, to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, Lancs, as soon as possible.

ROCHDALE AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. BIRCH HILL HOSPITAL. HOUSE OFFICER (obstetrics and gynæcology) post vacant. Pre- or post-registration post of 6 months duration. Recognised for D.Obst.R.C.O.G.

Apply to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, at once.

ROCHFORD, ESSEX. GENERAL HOSPITAL. Locum REGISTRAR required in the Obstetric Unit at the above Hospital, for 2 weeks from 26th April, 1957.

Applications to the undersigned as soon as possible.

J. C. FIELD, Secretary.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) RESIDENT HOUSE SURGEONS (2) required immediately in the General Surgical Unit. Recognised for F.R.C.S. Open to either pre-registration applicants or to fully qualified practitioners. This very active Unit of a total of approximately 180 Beds affords ample opportunities for candidates to obtain first-class tuition and experience. The candidates appointed will be attached to a unit of approximately 60 Beds.

Applications should be forwarded immediately to the Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER (resident or non-resident) required for duties in the Casualty Department. Available for Male or Female applicants. This is a large General Hospital with specialised departments dealing with all types of acute medical and surgical cases. The post affords good opportunity for gaining tuition and experience.

Applications should be forwarded immediately to the Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) RESIDENT HOUSE SURGEON (Male) required immediately. (Not pre-registration appointment.)

Applications should be forwarded to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) RESIDENT HOUSE PHYSICIAN (Male) required immediately. Not pre-registration appointment.

Applications should be forwarded to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

RYDE. ROYAL I.W. COUNTY HOSPITAL. Isle of Wight GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. CASUALTY AND ORTHOPÆDIC OFFICER required at the above Hospital, either as Registrar (£935–£1061 10s.) or as Junior Hospital Medical Officer (£852 10s.–£55–£1182 10s.). The appointment is recognised for the F.R.C.S. and is non-resident, but a furnished flat suitable for a married applicant is available if required.

Forms of application may be obtained from the Group Secretary, Hospital Management Committee, Clatterford House, Carisbrooke, I.W., and should be returned not later than 10th May.

SALFORD. HOPE HOSPITAL. Salford Hospital Management Committee. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER ANÆSTHETIST. In the theatres about 3000 operations are performed annually. 2 Consultant Anæsthetists are available. The Hospital is recognised for the D.A. and the F.F.A.R.C.S.

Applications, together with the names and addresses of 2 referees, should be forwarded to the Secretary, Hope Hospital, Salford, 6, as soon as possible.

SALISBURY GENERAL HOSPITAL. Applications are invited for the appointment of RESIDENT OBSTETRIC AND GYNÆCOLOGICAL HOUSE SURGEON (recognised by R.C.O.G.)/HOUSE SURGEON to run consecutively from 2nd May, 1957, for a period of 6 months in each post commencing with House Surgeon post. The posts are open to pre-registration candidates.

Apply, giving names and addresses of 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. Obstetrics and Gynæcology. DUNDEE TEACHING HOSPITALS. Applications are invited for the post of RESIDENT REGISTRAR in Obstetrics and Gynæcology at Dundee Royal Infirmary (534 Beds) and Maryfield Hospital (369 Beds), the main general teaching hospitals associated with the University of St. Andrews. The post is recognised for M.R.C.O.G. Applicants should have held house appointments in obstetrics and gynæcology and have had experience in general medicine and surgery. Salary and conditions of service in accordance with national agreement.

Further particulars and forms of application from the Secretary to the Board, 430, Blackness-road, Dundee, with whom applications must be lodged not later than 4th May, 1957.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. Obstetrics and Gynæcology. DUNDEE TEACHING HOSPITALS. Applications are invited for the post of Locum REGISTRAR in Obstetrics and Gynæcology at Dundee Royal Infirmary (534 Beds) and Maryfield Hospital (369 Beds), the main general teaching hospitals associated with the University of St. Andrews. Salary and conditions of service in accordance with national agreement.

Further particulars and forms of application from the Secretary to the Board, 430, Blackness-road, Dundee, with whom applications must be lodged not later than 4th May, 1957.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. Anæsthetics. DUNDEE TEACHING HOSPITALS. Applications are invited for a post as REGISTRAR in Anæsthetics in the Dundee Teaching Hospitals—Dundee Royal Infirmary (534 Beds) and Maryfield Hospital (370 Beds), the main general teaching hospitals associated with the University of St. Andrews. Salary and conditions of service in accordance with national agreement.

Forms of application and further particulars from the Secretary to the Board, "Braeknowe," 430, Blackness-road, Dundee, with whom applications must be lodged not later than 27th April, 1957.

SCOTLAND. NORTH-EASTERN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR to the Regional Orthopædic Unit. Candidates should have experience in orthopædic surgery and preferably should hold an appropriate higher qualification.

Applications, giving 2 names for reference, should be submitted by 8th May, 1957, to the Secretary, North-Eastern Regional Hospital Board, Scotland, 1, Albyn-place, Aberdeen, from whom further particulars may be obtained.

SCOTLAND. NORTH-EASTERN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in E.N.T. Duties are mainly in hospitals situated in Aberdeen, but the officer appointed may be required to visit other hospitals in the Region. Candidates should have considerable experience in their specialty and preferably hold an appropriate higher qualification.

Applications, giving 2 names for reference, should be submitted by 8th May, 1957, to the Secretary, 1, Albyn-place, Aberdeen, from whom further particulars may be obtained.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in the Regional Pool of Anæsthetists, based on the Royal Infirmary of Edinburgh. The successful candidate will be seconded for periods of duty in peripheral hospitals, details of which may be obtained on application.

Apply, stating age, qualifications and previous experience, and the names of 3 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 6th May, 1957.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of SENIOR REGISTRAR in Medicine based at the Royal Infirmary, Glasgow, which will be for 1 year in the first instance.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, by 27th April, 1957.

SCUNTHORPE. WAR MEMORIAL HOSPITAL. (262 Beds.) SCUNTHORPE HOSPITAL MANAGEMENT COMMITTEE. Vacancy for HOUSE SURGEON—pre-registration or Senior House Officer according to experience. Busy hospital offering good opportunity for experience.

Applications, naming 2 referees, to Group Secretary.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) ORTHOPÆDIC HOUSE SURGEON required. Post recognised for Pre-registration Service and tenable for 6 months. The Hospital is the centre to which all trauma from a large industrial town and port is directed thus providing excellent experience in the treatment of traumatic conditions; patients with orthopædic conditions are also drawn from a wide area.

Applications, with copies of testimonials, should be sent as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON GENERAL HOSPITAL. (471 Beds.) RESIDENT HOUSE SURGEON required beginning May. Pre-registration candidates eligible.

Applications, with copies of recent testimonials, should be forwarded to Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SHEFFIELD. CITY GENERAL HOSPITAL. (652 Beds. Recognised for Final Fellowship examination.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (thoracic surgery) required. Appointment for 1 year in first instance. General Hospital with Regional Department of Cardiology. Thoracic Surgical Unit deals with tuberculous and non-tuberculous cases. Previous thoracic surgical experience desirable.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 29th April, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD. CITY GENERAL HOSPITAL. Sheffield REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT REGISTRAR (anæsthetics) required at the above Hospital. Recognised for the F.F.A. R.C.S. examination. Successful candidate to reside in Hospital when "on call." This is a large general hospital (652 Beds) with a Department of Thoracic Surgery, a Regional Cardiological Centre and a Professorial Gynæcological Unit. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 29th April, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD. KING EDWARD VII ORTHOPÆDIC HOSPITAL, Rivelin Valley-road, SHEFFIELD, 6. (144 Beds.) SHEFFIELD NO. 3 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER (resident) at the above Hospital. The post, which is normally held for 1 year in the first instance, will be subject to the terms and conditions of service for hospital medical staff. Salary £745 p.a. Emolument charge £150 p.a.

Applications, with names of 2 referees, to Group Secretary, Sheffield No. 3 Hospital Management Committee, Lodge Moor Hospital, Sheffield, 10.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications invited for the following posts:—

Royal Infirmary

(*a*) NON-RESIDENT SENIOR REGISTRAR or REGISTRAR to the Rupert Hallam Department of Dermatology. Grade according to qualifications and experience. Post vacant 16th July.

Closing date for applications, 27th April.

(*b*) Resident Locum HOUSE OFFICER or SENIOR HOUSE OFFICER in the Thoracic Department. The post is vacant now and is for the period up to 15th July, 1957.

Applications to be sent at once.

Children's Hospital

(*c*) NON-RESIDENT CASUALTY OFFICER (Senior House Officer grade) at the above Hospital. Vacant 1st July, 1957.

Closing date for applications 3rd May, 1957.

Applications for the above posts should state age, qualifications and experience, give the names and addresses of 3 referees, and be sent as follows:

For post (*a*) The Chief Administrative Officer, The United Sheffield Hospitals, Royal Hospital, West-street, Sheffield, 1.

For post (*b*) The Superintendent, Royal Infirmary, Infirmary-road, Sheffield, 6.

For post (*c*) The Superintendent, Children's Hospital, Western Bank, Sheffield, 10.

In the case of post (*c*) 2 referees will be accepted.

SHEFFIELD. UNITED SHEFFIELD HOSPITALS BOARD OF GOVERNORS AND SHEFFIELD REGIONAL HOSPITAL BOARD. Reciprocal Training Scheme for Senior Registrars. Whole-time SENIOR REGISTRAR in Obstetrics and Gynæcology required. Initial tenure at Leicester Royal Infirmary (492 Beds). Appointment for 1 year in first instance and, subject to satisfactory work and progress, renewable thereafter annually. Incumbent will proceed to the Jessop Hospital for Women, Sheffield, for the second period of the appointment in accordance with arrangements under the Reciprocal Training Scheme.

Further details and form of application from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 6th May, 1957.

SHOTLEY BRIDGE GENERAL HOSPITAL, Shotley BRIDGE, CONSETT, CO. DURHAM. NORTH WEST DURHAM HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from suitably qualified medical practitioners for the whole-time post of JUNIOR HOSPITAL MEDICAL OFFICER (resident) in the Plastic Surgery Department (50 Beds). Salary scale £775–£50–£1075 p.a. with deduction of £170 p.a. for board-residence.

Applications, stating age, qualifications, experience, and enclosing copies of 2 recent testimonials, to the Group Secretary.

SHOTLEY BRIDGE GENERAL HOSPITAL, Shotley BRIDGE, CONSETT, CO. DURHAM. NORTH WEST DURHAM HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER (Plastic Unit), which is tenable for 12 months in the first instance, 6 months of which are recognised for the F.R.C.S. Salary is £745 p.a., less £150 for residential accommodation.

Applications, together with testimonials, to the Group Secretary.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (455 Beds.) HOUSE OFFICER (general surgery) required. Pre-registration post. Hospital recognised for F.R.C.S.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (455 Beds.) HOUSE OFFICER (orthopædics) required. Recognised pre-registration post. Hospital recognised for F.R.C.S.

Applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOCKPORT INFIRMARY. (163 Beds.) Locum Senior HOUSE OFFICER (anæsthetics) required.

Applications, with full particulars and copies of 2 recent testimonials, to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

SIDCUP AND SWANLEY HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (casualty and orthopædic) required. The successful applicant will serve 3 months in the Orthopædic Department and 3 months as Casualty Officer. The post is recognised under the Fellowship regulations as a period of 6 months casualty training.

Applications, stating age, qualifications and experience, together with names and addresses of 2 referees, should be sent to the Secretary, Queen Mary's Hospital, Sidcup, Kent.

SOUTHEND GENERAL HOSPITAL. (262 Beds.) Applications are invited from pre-registration and fully registered practitioners for the post of HOUSE PHYSICIAN. Post vacant 27th May.

Applications, stating age, qualifications, experience, &c., together with copies of recent testimonials, should reach the undersigned at the Hospital by 25th April, 1957.

J. C. FIELD, Secretary.

SOUTHEND GENERAL HOSPITAL. Applications are invited for the post of DEPUTY CASUALTY OFFICER (Senior House Officer grade) with duties in the Fracture and Orthopædic Department for a period of 6 months from May to October. Post resident.

Applications, stating age, qualifications and experience, with copies of recent testimonials, to reach the undersigned as soon as possible. J. C. FIELD, Secretary.

SOUTHERN LANARKSHIRE HOSPITALS BOARD OF MANAGEMENT. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER in Midwifery and Gynæcology at the William Smellie Maternity Hospital, Lanark, and Law Hospital, Carluke, with occasional duties at other hospitals as may be required.

Applications, stating age, qualifications and previous experience, together with the names of 2 referees, should be submitted to the Group Medical Superintendent, Law Hospital, Carluke.

SOUTH WEST METROPOLITAN REGIONAL HOS-PITAL BOARD. Psychiatric Registrars training scheme. Applications are invited for the appointment of REGISTRAR for 6 months periods at the hospitals of St. Ebba's, Horton, Long Grove and The Manor in succession. Wide experience is available in all forms of psychosis, in neurosis and in mental deficiency under modern methods of treatment. Special experience may be gained in the Mott Clinic for General Paralysis, St. Ebba's Juvenile Unit and in Mapother House, Long Grove, for acute psychosis; also in the associated observation wards and outpatient departments. The appointment will be tenable from July, 1957. Salary, &c., in accordance with the agreed terms and conditions of service of hospital medical staff. For residents appropriate charges are made for full residential amenities. Candidates may visit the hospitals by appointment with the Physicians-Superintendent.

Application forms may be obtained from the Group Secretary, St. Ebba's and Belmont Group Hospital Management Committee, Group Office, Belmont Hospital, Brighton-road, Sutton, Surrey, and completed forms (5 copies) should be returned to him within 2 weeks of the appearance of this advertisement.

SOUTH-WESTERN REGIONAL HOSPITAL BOARD AND UNITED BRISTOL HOSPITALS. Applications are invited by the above Boards for the joint appointment of REGISTRAR in Pædiatrics. The appointment will be held for 1 year in the first instance commencing on 18th June, 1957, and will be renewable for a further year. For the first year, the successful candidate will work at the South Devon and East Cornwall Hospital, Plymouth. When the appointment is renewed for a second year, the Registrar will be transferred to the United Bristol Hospitals with main duties in the Bristol Royal Hospital for Sick Children and the Bristol Maternity Hospital, a post in which the holder is normally appointed Tutor in Child Health in the University of Bristol.

Applications, stating date of birth, qualifications, and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 30th April, 1957.

SWINDON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SWINDON HOSPITALS. Applications invited for post of RESIDENT HOUSE PHYSICIAN in acute Medical Unit of 64 Beds at St. Margaret's Hospital. Recognised for training under pre-registration internship regulations and vacant on 25th May, 1957.

Full details, with names of 3 referees, to Secretary, 7, Okus-road, Swindon, immediately.

SWINDON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for post of RESIDENT HOUSE SURGEON for General Surgical Unit of 80 Beds at Victoria Hospital. Recognised for F.R.C.S. and training under pre-registration internship regulations, and vacant on 18th May, 1957. Married accommodation available.

Full details, with names of 3 referees, to Secretary, 7, Okus-road, Swindon, immediately.

SWANSEA HOSPITAL, Swansea. (413 Beds.) Glantawe HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER in the Surgical Unit of the above Hospital. Immediate vacancy. The post is recognised under the F.R.C.S. (Eng.) regulations.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, should be forwarded to the Hospital Secretary. T. E. JONES, Group Secretary.

SWANSEA HOSPITAL, Swansea. (413 Beds.) Glantawe HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of HOUSE OFFICER in the Surgical Unit of the above Hospital. The post is recognised for pre-registration purposes.

Salary will be :—

Pre-registration Officers: First year—£467 10s. p.a.
Second year—£522 10s. p.a.

Registered Practitioners—£577 10s. p.a.

Applications, with full particulars, should be sent to the Hospital Secretary. T. E. JONES, Group Secretary.

SHREWSBURY. ROYAL SALOP INFIRMARY/COP-THORNE HOSPITAL. (500 Beds.) HOUSE SURGEON, vacant immediately. Pre-registration candidates eligible. Recognised for the F.R.C.S.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

ST. ASAPH GENERAL HOSPITAL, St. Asaph. (201 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER required immediately at the above Hospital. Married quarters available if required.

Applications, stating age, qualifications and experience, with copies of 2 recent testimonials, to be sent forthwith to the Group Secretary, Clwyd and Deeside Hospital Management Committee, "Rhianfa," Russell-road, Rhyl, Flintshire.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. Locum ANÆSTHETIC REGISTRAR required 20th May–6th June. Resident post.

Applications, with copies of 2 testimonials, to Secretary.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE PHYSICIAN required for post vacant 1st June. Preference given to persons seeking pre-registration post.

Applications, stating age, experience and qualifications with dates, with copies of 2 testimonials, to Secretary.

TORQUAY. TORBAY HOSPITAL. (166 Beds.) Senior RESIDENT HOUSE OFFICER (anæsthetics) required 21st April, 1957. There is a complement of 6 Resident House Officers, and the Hospital is recognised for the D.A. and the F.F.A.R.C.S.

Applications, stating qualifications, age, nationality, with copy testimonials, to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

TORQUAY. TORBAY HOSPITAL. (166 acute general beds.) HOUSE OFFICER (medicine), Male or Female, required approximately 28th May, 1957. Pre-registration appointment. General duties which will include some work in the E.N.T., the Ophthalmic and Radiotherapy Departments.

Applications, stating qualifications, nationality, age, together with copy testimonials (quoting Ref. F.955/80), to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

TUNBRIDGE WELLS. KENT AND SUSSEX HOSPITAL. (303 staffed available beds.) Locum RESIDENT SURGICAL OFFICER required immediately, pending permanent appointment. Salary £17 10s. per week, less deduction at rate of £170 p.a. for residence.

Applications, stating age, nationality, qualifications, previous appointments with copies of 2 recent testimonials, to Group Secretary, Sherwood Park, Pembury-road, Tunbridge Wells, as soon as possible.

UXBRIDGE CHEST CLINIC, High-street, Uxbridge, MIDDLESEX. MEDICAL REGISTRAR. Candidates prepared to do reasonable number of sessions would be considered. Duties include work at Uxbridge Chest Clinic and at Mount Pleasant Hospital for Chest Disorders, Southall and Hillingdon Hospital. Non-resident post. Candidates require experience in general medicine and some experience in treatment of tuberculosis and diseases of chest. Further details from Chest Clinic Physician. Clinic and hospitals may be visited by apvointment.

Application forms obtainable from, and returnable to, Group Secretary, Uxbridge Group Hospital Management Committee, The Furze, Pield Heath-road, Uxbridge, Middx, by 29th April.

WARWICK (near). CENTRAL MENTAL HOSPITAL. (1400 Beds.) SENIOR HOUSE OFFICER. Neurosis Unit, adult and child psychiatry clinics, Departments of Electroencephalography Occupational Therapy, Psychology and social work. Recognised for D.P.M. Flat available.

Applications, with names and addresses of 3 referees, to Medical Superintendent within 14 days.

WATFORD. PEACE MEMORIAL HOSPITAL. North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR in Pathology (non-resident) required in the Department of Morbid Anatomy at the Group Laboratory at above Hospital. Previous experience essential. Post vacant immediately, Laboratory may be visited by direct appointment.

Application form obtainable from, and returnable to, the Secretary, West Herts Group Hospital Management Committee, 9, Rickmansworth-road, Watford, Herts, by not later than 10 days after appearance of this advertisement.

WATFORD. PEACE MEMORIAL AND SHRODELLS HOSPITALS, WATFORD. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SURGICAL REGISTRAR required at the above Hospitals. Post recognised for F.R.C.S. Post vacant immediately. Hospitals may be visited by direct appointment.

Application form obtainable from, and returnable to, the Secretary, West Herts Group Hospital Management Committee, 9, Rickmansworth-road, Watford, Herts, by not later than 10 days after appearance of this advertisement.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-PITAL. (315 Beds.) SENIOR HOUSE OFFICER (orthopædics) required. Post recognised F.R.C.S. Wide experience available under Area Orthopædic team. Appointment for 6 months in first instance. Vacant immediately.

Applications, with copies of 2 testimonials, to the Group Secretary.

WARRINGTON GENERAL HOSPITAL. (344 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (pædiatrics), Male or Female. Post recognised for D.C.H. Scale of salary £819 10s. p.a., less £150 for residential emoluments.

Applications to be forwarded to—
HENRY L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o The General Hospital, Warrington, Lancs.

CANADA. NORTHWESTERN GENERAL HOSPITAL, TORONTO, 9, ONTARIO. Accredited Hospital, 110 Beds, requires INTERNES. Applications are being considered for Rotating Interneship. Pay $150 per month, plus room and board. Ideal preparation for general practice in Toronto area.

British University qualifications accepted in Canada.

CANADA. ST. PAUL'S HOSPITAL, Vancouver, British COLUMBIA, CANADA. Applications are invited for 1-year JUNIOR ROTATING INTERNESHIPS at approved large general hospital. Remuneration $150 per month. Assistance with fare will be considered, details on request .

Apply—Sister Superior, St. Paul's Hospital, 1081 Burrard-street, Vancouver, British Columbia, Canada. Canadian, American or British graduates only are acceptable.

IOWA, U.S.A. IOWA METHODIST HOSPITAL, DES MOINES, IOWA. 400-Bed General Community Hospital fully approved for resident training in all specialties. Also have opportunities for 1-year INTERNS. U.S.A. citizenship and licensure not required. Stipend $175 per month, plus full maintenance for Physician ; apartment available for family.

Apply Administrator.

Public Appointments

ADMINISTRATIVE COUNTY OF LONDON. METROPOLITAN BOROUGH OF BATTERSEA. Combined appointments of DEPUTY DIVISIONAL MEDICAL OFFICER AND DEPUTY MEDICAL OFFICER OF HEALTH of Battersea. The London County Council and the Metropolitan Borough Council of Battersea invite applications from registered medical practitioners holding a Diploma in Public Health for the combined appointment of Deputy Divisional Medical Officer of the County Council's Health Division 9, comprising the Metropolitan Boroughs of Battersea and Wandsworth, and Deputy Borough Medical Officer of Health for Battersea. Remuneration will be in accordance with the formula for mixed appointments approved by Committee " C " of the Medical Whitley Council and lying within the range £1875–£2217. Commencing salary within this range will depend on the points on the constituent scales at which the 2 authorities respectively place the successful candidate. These 2 scales are : Deputy Divisional Medical Officer, £1675–£55–£2005 and Deputy Borough Medical Officer of Health, £1597–£55–£1817–£50–£1867.

Full particulars of the combined appointments and application forms may be obtained from the Clerk of the London County Council (W.1), The County Hall, Westminster Bridge, London, S.E.1. Completed forms should be returned by not later than first post on 4th May, 1957. (463.)

BRISTOL. CITY AND COUNTY OF BRISTOL. DEPARTMENT OF PUBLIC HEALTH. Applications invited from medical officers of more senior status for post of ASSISTANT MEDICAL OFFICER OF HEALTH (Male or Female) who will be responsible to Senior Medical Officer for Maternal and Child Welfare, supervision of problem families, and such other duties assigned to him from time to time. Preference given to candidates possessing Diploma in Public Health or similar qualification in state medicine, but consideration given to candidates previous experience. He will be required to devote the whole of his time to his duties and will not be allowed to engage in private practice. Post subject to 3 months notice on either side ; superannuable ; medical examination. Salary £1150–£50(3)–£1300–£55(5)–£1575.

Application forms obtainable from me returnable by 27th April. R. C. WOFINDEN, Medical Officer of Health.
Central Health Clinic, G.P.O. Box No. 201,
Tower Hill, Bristol, 2.

BRITISH RAILWAYS. Eastern Region. Applications are invited from registered medical practitioners, under 35 years of age, for appointment as ASSISTANT MEDICAL OFFICER in the Eastern Region, British Railways. Candidates should have a good clinical background and an interest in Industrial Medicine. Experience in general practice is desirable. Salary on appointment £1325 p.a. and membership of the superannuation fund, subject to medical examination, obligatory. The successful applicant is likely to be located at Doncaster and will be required to travel throughout the Region for relief purposes.

Applications, giving full particulars of age, qualifications, and experience, and 2 references, should be sent to the Regional Medical Officer, Eastern Region, General Offices, Marylebone Station, N.W.1, not later than 30th April, 1957.

NAVY, ARMY, AND AIR FORCE INSTITUTES. Applications are invited from general practitioners in the undernoted towns for the appointment in a part-time capacity as MEDICAL OFFICERS to this Corporation. Successful applicants would be required to examine and report on the condition of employees of the Corporation who may be referred to them from time to time. Fees for this work will be paid on a scale agreed with the British Medical Association.

Applications, giving full details of qualifications and experience, should be sent to the Principal Medical Officer, Navy, Army, and Air Force Institutes, Kennington-lane, London, S.E.11, not later than 4th May, 1957.

The towns for which applications are invited are :—

GILLINGHAM.	FOLKESTONE.
CANTERBURY.	HASTINGS.
DEAL.	BRIGHTON.
MAIDSTONE.	GUILDFORD.
DOVER.	TUNBRIDGE WELLS.

DERBYSHIRE COUNTY COUNCIL. Applications are invited from Male medical practitioners for the whole-time appointment of SENIOR ASSISTANT MEDICAL OFFICER. Possession of the D.P.H. (or its approved equivalent) is essential and experience in school health and mental deficiency work is advantageous. The work will be largely administrative in connection with the Public Health and School Health Services but other duties may be assigned to the Officer appointed, who will work under the direction of the County Medical Officer. Office accommodation will be provided in the Central Office. The salary is £1210–£55 (5)–£50 (4)–£1685 p.a., together with a travelling allowance.

Applications should be submitted to the undersigned by 29th April, 1957. Application forms are not provided, but the conditions of service will be supplied on request.

J. B. S. MORGAN, County Medical Officer of Health.
County Offices, St. Mary's Gate, Derby.

FACTORY DOCTORS. Factories Acts, 1937 and 1948. The following appointments as Appointed Factory Doctor are vacant. Apply to Chief Inspector of Factories, 19, St. James's-square, London, S.W.1.

District	*County*	*Latest date for receipt of applications*
WOOD GREEN	.. MIDDLESEX ..	.. 11TH MAY, 1957
GNOSALL ..	.. STAFFORD ..	.. 11TH MAY, 1957

GOVERNMENT OF BRITISH GUIANA. Medical Superintendent required to take charge of Mental Hospital at Berbice, to supervise staff, patients, revenue and expenditure, and the psychiatric clinic held monthly at Georgetown.

Appointments as follows :—

(*a*) On contract for 3 years with gratuity (taxable) of 22½% of basic salary payable at 6 monthly intervals or in lump sum on completion of engagement ; or

(*b*) from National Health Service retaining superannuation rights (up to 6 years) and receiving a gratuity (taxable) of 20% of aggregate salary after engagement.

Salary £1800 a year plus allowance of £250 in lieu consultation fees. No private practice. Income-tax at local rates. Free unfurnished quarters provided. Generous leave. Free passages for Officer, wife, and children under 18, not exceeding 5 persons in all, on appointment and completion of engagement. Candidates must possess medical qualifications registrable in United Kingdom and have had 2 years experience in Mental Hospital. Diploma in Psychological Medicine highly desirable.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD. 117/30/05).

HER MAJESTY'S OVERSEAS SERVICE. Tanganyika. PATHOLOGIST required for general pathological work under direction of Senior Pathologist with likelihood of duties with Police Force. Must possess medical qualifications registrable in United Kingdom and have experience in general pathology and forensic medicine. A higher qualification in bacteriology or pathology is desirable but not essential. Appointment can be made on permanent basis with pension (non-contributory), or on short-term contract with gratuity (taxable) on satisfactory completion of service. National Health Service Doctor may retain superannuation rights (up to 6 years) and receive gratuity (taxable) of 20% of aggregate salary after engagement. Salary ranges from £1284 to £2115 a year, starting point determined by experience. 4 extra increments given for approved higher qualifications. Only permanent officers can be members of Her Majesty's Overseas Civil Service. Quarters generally available at rental of £30–£78 a year according to size and type ; furniture £12–£24 a year. Free passages in both directions for Officer and wife and up to cost of 1 adult fare for children. Taxation at local rates. Annual local leave permissible and generous home leave after each tour of from 30 to 36 months. Educational facilities.

Application forms from Director of Recruitment, Colonial Office, Great Smith-street, London, S.W.1 (quoting No. BCD. 117/8/028).

YORKSHIRE. DIVISIONAL ADMINISTRATION OF THE PREVENTIVE MEDICAL SERVICE IN THE ADMINISTRATIVE COUNTY OF THE WEST RIDING OF YORKSHIRE. PUBLIC HEALTH DIVISION NO. 5. Appointment of MEDICAL OFFICER OF HEALTH to the Borough of Pudsey, the Aireborough, Horsforth, Ilkley and Otley Urban District Councils and the Wharfedale Rural District Council, and DIVISIONAL MEDICAL OFFICER to the West Riding County Council. Applications are invited from registered medical practitioners who must also be registered in the medical register as the holder of a Diploma in Sanitary Science, Public Health, or State Medicine, for the above-mentioned whole-time appointment. The effect of the mixed appointment will be to secure that the planning of the day-to-day administration and the execution of practically all public health matters of the division will be in the hands of 1 person, the Divisional Medical Officer of Health. A Divisional Public Health Office with necessary staff will be provided.

The salary attached to the post is as follows :—

(*a*) For Medical Officer of Health duties : £1247 10s.–£27 10s. (4)–£25 (1)–£1382 10s. p.a.

(*b*) For County Council duties : £981 5s.–£31 5s. (1)–£34 7s. 6d. (7)–£1253 2s. 6d. p.a.;

making the total salary payable for the mixed appointment £2228 15s. p.a., rising to £2635 12s. 6d. p.a.

In addition, there will be a travelling and subsistence allowance at the rate of £245 p.a.

The appointment will be made jointly by the District Councils and the County Council and the person appointed will not be permitted to engage in private practice.

Forms of application and terms and conditions of service may be obtained from the County Medical Officer, County Hall, Wakefield, to whom completed forms must be returned not later than 4th May, 1957. Canvassing of members of the appointing bodies directly or indirectly will disqualify any candidate for the post. W. RICHARD CRUSE, Town Clerk, Pudsey.
J. WOOD-WILSON, County Medical Officer.

LIVERPOOL. CITY OF LIVERPOOL. Public Health DEPARTMENT. Applications are invited for the appointment of ASSISTANT MEDICAL OFFICER (Maternity and Child Welfare Section). Salary £1050–£1475 p.a. The work will include attendance at clinics and such other duties as may be assigned by the Medical Officer of Health. Possession of the D.P.H. and experience in paediatrics will be an advantage. The appointment is superannuable and subject to the Standing Orders of the City Council. Canvassing disqualifies.

Application forms obtainable from the Medical Officer of Health, Gordon House, Belmont-grove, Liverpool, 6, should be returned to him by 30th April, 1957. THOMAS ALKER, Town Clerk.

MENTAL HYGIENE AUTHORITY—DEPARTMENT OF HEALTH, VICTORIA, AUSTRALIA. Applications, addressed to the Secretary, Mental Hygiene Authority, 300, Queen-street, Melbourne, C.1, Victoria, Australia, are invited for the undermentioned positions. Statement setting out experience, qualifications, date of birth, and copies of 2 recent testimonials should accompany the application.

MEDICAL OFFICER (Male).

Country Hospital.

Salary £1847 to a maximum of £2362. p.a. Annual increments : 3 each of £50 and 2 of £100.

SENIOR MEDICAL OFFICER (Male).

Metropolitan or Country Hospital.

Salary £2362 to a maximum of £2612 p.a. Annual increments : 2 each of £100 and 1 of £50.

PSYCHIATRIST (Male).

Metropolitan or Country Hospital.

Salary £2562 to a maximum of £2762 p.a. Annual increments : 2 each of £100.

In addition to above salaries, an allowance of £100 p.a. is payable if in possession of a Diploma in Psychological Medicine or higher medical qualifications.

Qualifications required.

Medical Officer.

Appointees must be qualified for registration by the Victorian Medical Board.

Postgraduate Training

After twelve (12) months service at a Country Hospital, transfer to a Metropolitan Hospital is arranged, so as to enable Medical Officers to acquire the D.P.M. or higher qualifications. Facilities to attend lectures are arranged and University fees for the D.P.M. are refunded after candidate has sat for the examinations, provided that he signs an agreement to remain in the Department for at least 2 years after acquiring the additional qualification.

Senior Medical Officer.

Appointees must be qualified for registration by the Victorian Medical Board and hold a D.P.M., M.D., or M.R.C.P. with a minimum of 2 years Mental Hospital experience.

Psychiatrist.

Appointees must be qualified for registration by the Victorian Medical Board, and hold a D.P.M., M.D., or M.R.C.P. and minimum of 3 years experience after having gained a post-graduate diploma or degree, as well as having made some scientific contribution or had some particular teaching experience. Outpatient experience is essential.

Good residences provided with 3 bedrooms, and some floor-coverings and blinds. A deduction of 7½% of standard salary, plus £45 8s. a year is made for residence, fuel, light, water, milk, vegetables, and laundry (which means £195 in the case of Senior Medical Officer and £210 in the case of Psychiatrist is deductable).

Superannuation. Available if desired.

Transport Expenses. A refund of transport costs of wife, family, and appointee to a maximum of £300 will be made if appointee contracts to remain in the service for at least 2 years.

Salary payable from date of embarkation.

H. J. MARTIN, Secretary, Mental Hygiene Authority.

PONTYPRIDD URBAN DISTRICT COUNCIL, Glamor- GAN COUNTY COUNCIL. Mixed appointment of Male MEDICAL OFFICER OF HEALTH for the Pontypridd Urban District and ASSISTANT MEDICAL OFFICER, Glamorgan County Council. Applications for the above appointment are invited from Male registered medical practitioners who hold the qualifications prescribed by the Sanitary Officers (Outside London) Regulations, 1935 and 1951, and who have been registered as medical practitioners for not less than 5 years. The salary for the mixed appointment will be £1600 4s. 7d. p.a. rising by 8 annual increments to a maximum of £1961 14s. 1d. p.a. The appointment will be subject to the Local Government Superannuation Acts, 1937/1953, and to the passing of a medical examination.

Forms of application and particulars of appointment can be obtained from the undersigned Clerk of the Pontypridd Urban District Council to whom they should be returned on or before Saturday, 4th May, 1957, endorsed "Medical Officer of Health."

BERNARD M. MURPHY, Clerk of the Pontypridd U.D. Council.
RICHARD JOHN, Clerk of the Glamorgan County Council.
Municipal Buildings, Pontypridd, Glam., 3rd April, 1957.

THE MEDICAL SERVICE OF THE ROYAL NAVY

VACANCIES FOR MEDICAL OFFICERS

Candidates are invited for Short Service Commissions of 3 years, on termination of which a gratuity of £600 (tax free) is payable. Ample opportunity is granted for transfer to Permanent Commissions on completion of 1 year's total service. Officers so transferred are paid instead a grant of £1500 (taxable).

All entrants are required to be British subjects whose parents are British subjects, medically qualified, physically fit, and to pass an interview.

Full particulars from the Admiralty Medical Department, Queen Anne's Mansions, St. James's Park, London, S.W.1.

Miscellaneous

MEDICAL RESEARCH COUNCIL want Physiologist, medical or non-medical honours graduate, at Poliomyelitis Centre, Hendon Isolation Hospital, Goldsmith-avenue, N.W.9, for work on respiratory muscle and joint testing. Salary at point in ranges £715–£900 or £950–£1250 p.a., plus child allowance.

Write (2 professional referees) Dr. A. B. KINNIER WILSON, Royal National Orthopædic Hospital, Stanmore, Middlesex.

Benger Laboratories Limited, the rapidly expanding British Pharmaceutical Company, wish to appoint a Physician in charge of their Medical Department. This is a senior appointment and calls for a person of wide experience, considerable tact, and good personality. Preference will be given to applicants who are under 35 years of age and have already had experience in the pharmaceutical or an allied industry. The Medical Department is responsible for : planning and arranging clinical trials of the Company's products ; liaison with clinical investigators throughout the world ; provision of a technical information service ; advising the publicity departments on matters of medical accuracy and ethics ; medical training of representatives, &c. The Company is expanding in both the domestic and international markets and is contributing substantially to the export drive. The person appointed must be a good administrator and lecturer and should be prepared to undertake a certain amount of foreign travel. The commencing salary for the post, which is pensionable, will depend very much on experience, qualifications, and age. The successful applicant will have the use of a Company car and will be paid full expenses whenever travelling on the Company's business.

Applications, which will be dealt with in strict confidence, should be sent to the Secretary, Benger Laboratories Limited, Holmes Chapel, Cheshire, not later than 3rd May.

Genatosan Ltd., Loughborough, Leicestershire, a member of the Fison Group of Companies, invites applications from registered medical practitioners for the position of full-time Medical Adviser to the Company. The duties will consist primarily of :—

(*a*) Advice on the development of new products.
(*b*) Supervision of the Company's medical literature.
(*c*) Organisation of clinical trials.
(*d*) General medical advice in relation to the Company's business.

This is a new, senior, permanent and pensionable appointment in a Company which is pursuing an energetic policy of product development and needs up-to-date and imaginative medical advice. The salary offered is of the order of £2000 p.a. Applicants should be 30–40 years of age and should have good clinical experience in hospital and general practice. Some knowledge of statistical methods would be an advantage.

Applications, stating age and qualifications, and giving full particulars of career, should be addressed to the Managing Director, Genatosan Ltd., Loughborough, Leicestershire.

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